Action Plan for Vulture Conservation in India

2020-2025

सत्यमेव जयते

Ministry of Environment, Forest and Climate Change
Government of India

Jatayu

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SWACHH BHARAT ABHIYAAN.

LET'S SAVE THEM FROM EXTINCTION
AND KEEP OUR ENVIRONMENT CLEAN.

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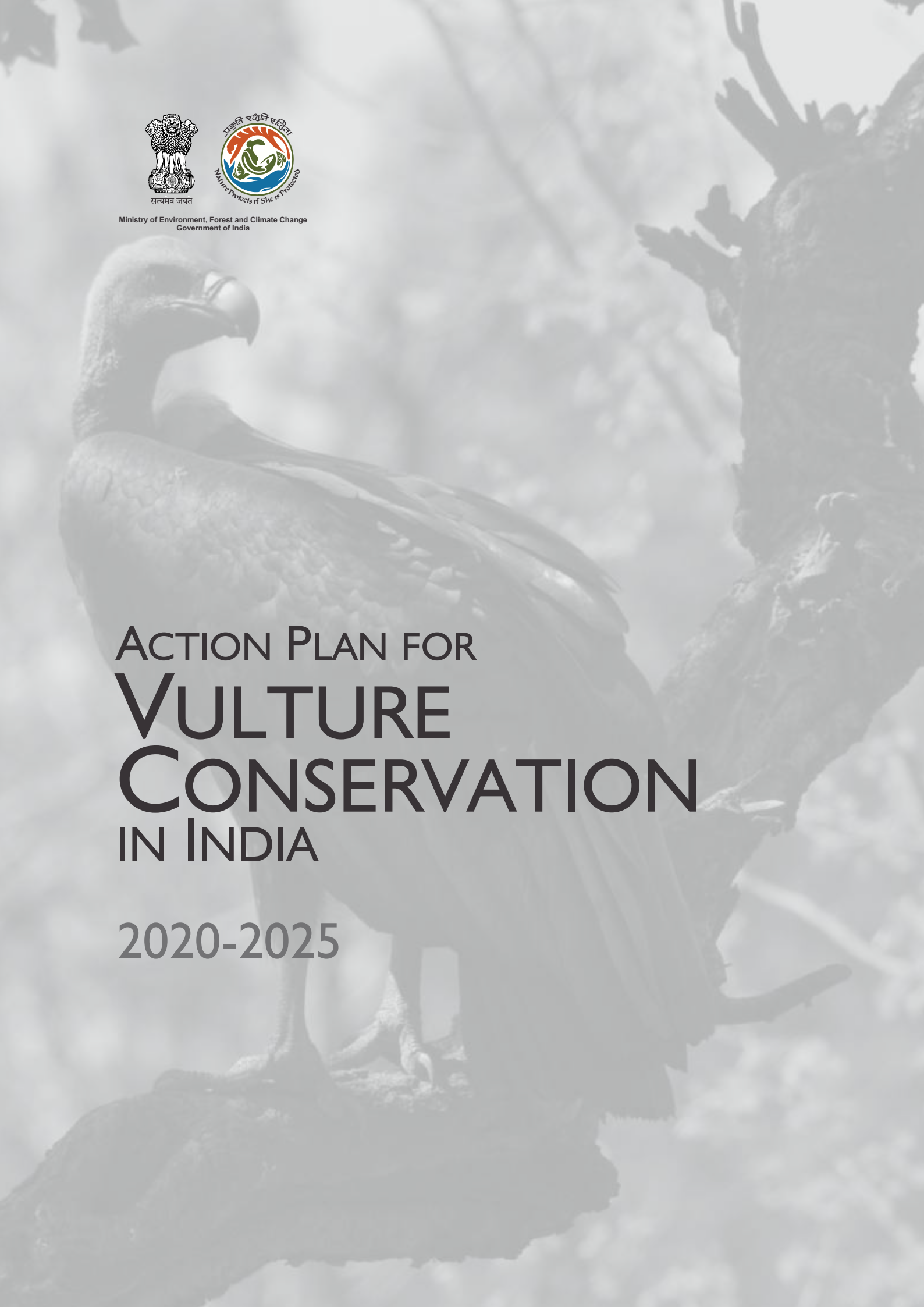

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Ministry of Environment, Forest and Climate Change
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PREFACE

Shri Soumitra Dasgupta IFS
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The crash in their population from estimated 4 crores in the early 1980s to less than a lakh by 2007 is unprecedented in the animal world. It is, however, encouraging to know that the implementation of the Action Plan for Vulture Conservation 2006 succeeded in halting the declines of the vulture populations....

Adult Long-billed Vulture
Photo: Batuk Bhil

मंत्री
पर्यावरण, वन एवं जलवायु परिवर्तन
सूचना एवं प्रसारण और
भारी उद्योग एवं लोक उद्यम
भारत सरकार

MINISTER
ENVIRONMENT, FOREST & CLIMATE CHANGE,
INFORMATION AND BROADCASTING AND
HEAVY INDUSTRIES & PUBLIC ENTERPRISES
GOVERNMENT OF INDIA

सत्यमेव जयते

प्रकाष जावडेकर
Prakash Javadekar

FOREWORD

I am pleased to write the foreword for this important Action Plan for Vulture Conservation in India (APVC) 2020-2025. Vultures are the soldiers of the "Swachh Bharat Abhiyan" of the Hon'ble Prime Minister of India and are truly social birds. They soar on thermals in loose dispersed flocks and can converge from long distances in hundreds when a vulture spots a carcass and starts taking tight circles, triggering a cascading effect. Being specialized scavengers, they play a very important role in quickly disposing carcasses that could harbour millions of pathogenic bacteria and fungus and cause serious implications for human and animal health. This is how they help in keeping India's countryside clean.

This Action Plan for Vulture Conservation in India, 2020-2025, rightly advocates the prevention of misuse of veterinary non-steroidal anti-inflammatory drugs (NSAIDs) by ensuring their sale only on prescription. This would ensure that banned drugs are not used in veterinary treatment. The plan also strongly recommends that the veterinary treatment should be given only by qualified veterinarians which would prevent overuse of NSAIDs in treating livestock as toxicity of most of the drugs is dose dependent.

The scientific manner of disposal of livestock carcasses will ensure that the vultures do not get exposed to the carcasses of animals that died during treatment. This should be done as soon as possible.

It is also important to have strong and sustained awareness programmes to make all the stakeholders aware of the importance of conservation of vultures and the measures undertaken by MoEFCC to prevent the possible extinction of vultures.

This APVC 2020-2025, cannot be implemented by the MoEFCC alone without the active support of the Ministry of Health and Family Welfare (MoHFW) and Ministry of Fisheries, Animal Husbandry & Dairying.

I congratulate all the officers of MoEF&CC and various NGOs involved in bringing out this to-the-point Action Plan. I am sure the implementation of the Action Plan will ensure the revival of the population of these efficient soldiers of "Swachh Bharat Abhiyan"

I wish all the best for the successful implementation of the Action Plan for Vulture Conservation in India, 2020-2025.

Date: 29.10.2020

Prakash Javadekar

It is heartening to know that Red-headed Vulture and Egyptian Vulture are also included in the breeding programme. It would be good to have breeding programme of other species of vultures also as it is a good insurance against extinction.

Adult White-backed Vulture

Babul Supriyo
Union Minister of State
Ministry of Environment, Forest & Climate Change
Government of India

सत्यमेव जयते

बाबुल सुप्रियो
केन्द्रीय राज्य मंत्री
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
भारत सरकार

स्वच्छ भारत
एक कदम स्वच्छता की ओर

FOREWORD

I am delighted to know that Ministry has come up with a very comprehensive "Action Plan for Vulture Conservation (APVC) in India, 2020-2025" which will create awareness among the general public about vultures on the important role they play in keeping the environment clean by removing the putrefying carcasses.

The ecological, social and cultural significance of vultures in India may be summed up as: scavenging on animal carcasses and thereby helping keep the environment clean. We could see vultures very easily in the early eighties even in the Metropolitan Cities, but we can hardly see any these days. Ministry has taken initiative to save this 'Critically Endangered' species. They have disappeared because of the drug 'Diclofenac', which is used for treating cattle. This drug is extremely toxic to vultures. The drug was banned by the Drug Controller General of India, based on the Ministry's recommendation in 2006. The Ministry also initiated Vulture Conservation Breeding Programme as an insurance against extinction, which I am happy to know, is very successful.

The Action Plan for Vulture Conservation (APVC) in India, 2020-2025 advocates expansion of the Conservation Breeding Programme of vultures by establishing more centres in different parts of the country. Red-headed Vulture and Egyptian Vulture are also included in the breeding programme.

The APVC 2020-2025 takes cognizance of the causes of mortality other than veterinary drug poisoning of vulture food. The poisoning of dead domestic animals by the owners to kill a rogue predator often is a problem for vultures in some parts of the country. Though it is not as serious a problem as poisoning of food by veterinary painkiller, which is far more widespread, it still needs attention.

I extend my very Best Wishes to the Wildlife Division of our Ministry who have taken all the efforts in drafting the action plan and also to various NG0s, especially BNHS, for being actively involved in vulture conservation and providing vital inputs.

Babul Supriyo

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Juvenile Long-billed vulture

सचिव
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SECRETARY
GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

आर पी गुप्ता
R P Gupta

FOREWORD

Action Plan for Vulture Conservation (APVC) in India 2020-2025

It is perhaps a bit surprising to see an Action Plan for the conservation of species that were abundant in India just a few decades ago. One of them, the Oriental White-backed Vulture, was considered the most common large bird of prey in the world. These birds being one of the scavenger species are so vital for our ecosystem.

During the days when I was growing up, it was a common sight to see these masters of the sky, soaring effortlessly, circling and climbing on the thermals. They would appear from nowhere in hundreds and descend on a carcass and devour it within minutes, before disappearing again!! They are now very rare to be seen.

It is rather worrisome to know that most of the vultures have perished due to a very popular painkiller, Diclofenac. There are other painkillers too that are now found to be toxic to them. Further, the overdosing of cattle and other livestock with painkillers, the easy availability of such prescription drugs across the counter and, consequently, their misuse further complicates vulture conservation efforts.

As suggested in the APVC, there is an urgent need for following the best practices in sale, distribution and administration of drugs and disposal of carcasses. There is an immediate requirement of synergy between the Ministry of Environment, Forest and Climate Change (MoEF&CC), Ministry of Fisheries, Animal Husbandry & Dairying and Ministry of Health and Family Welfare (MoH&FW) for the conservation of vultures. The Ministries should make sure that animals are treated by qualified veterinarians, given only the recommended doses of drugs and their carcasses are disposed of scientifically, when they die. This will go a long way in preventing poisoning of vultures. Banning of vulture toxic drugs is cumbersome and time consuming. So, it is better to be judicious in using the drugs and make the environment safe for the vultures.

It is, however, heartening to know that vulture populations are stabilizing, the Conservation Breeding Programme is well established and efforts are being taken to conserve the populations of vultures in the wild.

I would like to congratulate the entire team of the Task Force for their efforts in drafting the Action Plan for Vulture Conservation (APVC) in India, 2020-2025

Date: 29.10.2020

R P GUPTA

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Adult Slender-billed vulture
Photo: Rahul Bhagvat

संजय कुमार
SANJAY KUMAR

सत्यमेव जयते

वन महानिदेशक एवं विशेष सचिव
भारत सरकार
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
DIRECTOR GENERAL OF FOREST & SPL. SECY.
GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT, FOREST AND
CLIMATE CHANGE

FOREWORD

Soaring vultures over sites where dead animal laid were common sight in India; they quickly scavenged the dead. For Indians, who live with the largest cattle population in the world, vultures complement cultural beliefs while keeping our habitats ecologically safe by their rapid scavenging capacity. When their populations crashed and the most common vultures - Oriental white-backed, Long-billed, and Slender-billed - declined by more than 96 percent in just a single decade (1993-2003), dog and rat population exploded and so was rabies. Thanks to the concerted scientific research, that the causal agent was identified, and the cattle analgesic Diclofenac was quickly banned in India and few other South Asian countries to allow vultures' recovery. The speed of this unprecedented crash in vulture populations has no quick parallels in the modern animal world, and underlines the need for periodic monitoring of the populations of even abundant species, as inadvertent introduction of a single mortality factor could very quickly cause extinction of species.

The learnings from the implementation of the Action Plan for Vulture Conservation 2006 which also marked the establishment of a vulture conservation breeding programme are highly instructive, not only for vultures but for such other species as well. These learnings have also given a very sound basis for updating the Action Plan to its current edition (2020-25) which not only recommends national level multi-stakeholder monitoring of the vulture population involving the State forest departments, research institutions and NGOs, but also for additional Conservation Breeding Centres across the country and including the Red-headed vulture and Egyptian vulture.

The Action Plan rightly mentions coordination between the Ministries of Health and Family Welfare, Fisheries, Dairying and Animal Husbandry and Environment, Forest and Climate Change, for conservation of vultures to address the systemic issues in a much more comprehensive and coordinated manner.

I would like to congratulate the officers and staff of team MoEF&CC and experts from various organizations for preparing the much required Action Plan for Vulture Conservation in India, 2020-2025, and hope that the Plan will become a torch bearer for other countries in the world, so that 17 of the globally threatened species of vultures could be saved for the benefit of the human kind.

Date: 29.10.2020

(Dr. Sanjay Kumar)

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Juvenile White-backed vulture

सौमित्र दासगुप्ता
SOUMITRA DASGUPTA

सत्यमेव जयते

अपर वन महानिदेषक
भारत सरकार
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय

ADDITIONAL DIRECTOR GENERAL OF FOREST
GOVERNMENT OF INDIA
MINISTRY OF ENVIROMENT, FOREST AND CLIMATE CHANGE

PREFACE

The Action Plan for Vulture Conservation (APVC) in India, 2020-2025 is an urgent requirement for the vulture conservation in the country. With the expiry of the first action plan in 2009, it was imperative that a new document be drafted that outlines the vision for vulture conservation for the coming years. A number of conservation measures have been taken to prevent the possible extinction of at least three species of vultures, Oriental White-backed, Long-billed and Slender-billed based on the recommendation of the Action Plan for Vulture Conservation 2006. However, there are still a number of issues hampering vulture conservation in the country which need to be addressed as early as possible.

The APVC 2020-2025, has identified priority actions and additional action points for the conservation of vultures than mentioned in the action plan of 2006.

The prevention of poisoning of major vulture food, cattle carcasses, by non-steroidal anti-inflammatory Drugs (NSAIDs), is still the most urgent recommended action. Though the acute toxicity of diclofenac and other NSAIDs has been established for Gyps vultures only, but since all the species are genetically closely related and all scavenge on dead domestic and wild ungulates, they are likely to be susceptible to diclofenac and other veterinary NSAIDS.

Apart from diclofenac, there are at least three more drugs which were found toxic to vultures but they are still available in the market for veterinary use and need to be banned. The unrestricted sale of NSAIDs and overdosing of animals during treatment make vulture conservation even more challenging. Easy availability of carcasses of treated animals to vultures further compounds the problem. The existing Conservation Breeding Centres are also not enough, since, they do not cover the entire geographic area of the country. Apart from Conservation Breeding, these centres also cater to in-situ conservation efforts, thus, acting as a catalyst for conservation in areas around the centres. Furthermore, currently, there are no coordinated efforts aimed at estimating the population of vultures in the country. The estimate of population is important for the managers of protected areas and senior forest officers, to convince the decision makers about the necessity of resource allocation for vulture conservation.

The Vulture Safe Zone programme was initiated for conservation of remnant vulture population, reintroduction into the wild, of vultures bred in captivity and as means of raising awareness about the plight of vultures. However, work on establishing Vulture Safe Zones has not started in all the states and requires a lot more urgency.

Contd.

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The effective implementation of action plan is possible only when there is an effective strategy and timeline for achieving all the conservation actions. The most important action is prevention of the poisoning of domestic ungulate carcasses by veterinary NSAIDs. This would not be possible for the MoEFCC to achieve on its own. It would require the active collaboration of the MoH&FW and MoFAHD for the conservation of these specialized scavengers.

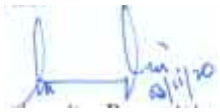
To achieve this, both the ministries will be part of a National Committee for implementation of the Action Plan. This Committee will be chaired by the Secretary, MoEFCC and will have the Drug Controller General of India (DCGI) and the Commissioner, Animal Husbandry as its members. The committee would be responsible for devising strategies to implement the proposed actions and would issue guidelines and directions to the State Committees for implementation of the instructions.

The State Committees will be Chaired by the PCCF (Wildlife) and the CWLW of the states and will also have the State Drug Controllers and Director of Animal Husbandry as its members. Both the committees can consult members from other Ministries and Institutions for inputs on specific action points. The National Committee will also act as the executive committee for the existing National Vulture Recovery Committee (NVRC) which has members from various stake holder groups. The National Committee will periodically review the work of the State Committees and monitor the progress. It is a five year plan with a suggestion of midterm review after 2 years.

The APVC will also benefit from the International plans like The Multi-Species Action Plan to Conserve African-Eurasian Vultures (Vulture MsAP) of the Convention of Migratory Species (CMS), regional action plan like the SAVE Blueprint for the Recovery of South Asia's Critically Endangered Gyps Vultures and the National Action Plan, the Vulture Conservation Action Plan for Nepal 2015-19.

I am grateful to Shri Prakash Javadekar, Hon'ble, Minister of Environment, Forest and Climate Change, Government of India and Shri Babul Supriyo, Hon'ble Minister of State for Environment, Forest and Climate Change, Government of India for their encouragement and concern for the conservation of these efficient soldiers of "Swachh Bharat Abhiyan". I am also thankful to Shri R.P. Gupta, Secretary, MoEF&CC, Dr. Sanjay Kumar, Director General of Forests & Special Secretary, MoEF&CC, the Chief Wildlife Wardens of all States and Union Territory Administrations of India, members of the task force of the APVC, 2020-2025 for their inputs in developing the Action Plan for Vulture Conservation (APVC) in India, 2020-2025.

I am confident that with the help of the various stakeholders, we will be able to successfully implement the APVC 2020 — 2025, in turn, ensuring that these scavengers rule the skies like they did once.



SOUMITRA DASGUPTA

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Photo: Batuk Bhil

Executive Summary

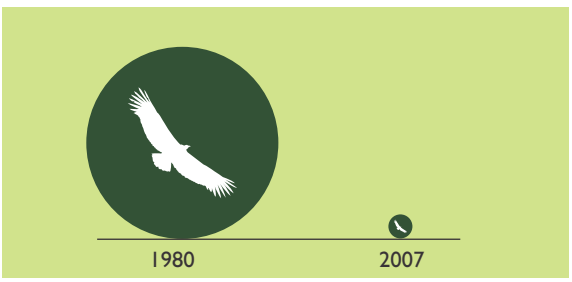
Nine species of vultures are recorded from India. Out of these, five belong to the genus Gyps: the Oriental White-backed Vulture (OWBV) Gyps bengalensis, the Long-billed Vulture (LBV) G. indicus, Slender-billed Vulture (SBV) G. tenuirostris (all residents), the Himalayan Vulture (HV) Gyps himalayensis (largely wintering) and the Eurasian Griffon (EG) Gyps fulvus (strictly wintering). Rest four are monotypic. These include the Red-headed Vulture (RHV) Sarcogyps calvus, Egyptian Vulture (EV) Neophron percnopterus, Bearded Vulture (BV) Gypaetus barbatus (all residents) and Cinereous Vulture (CV) Aegypius calvus (strictly wintering). A sub-species of EV Neophron percnopterus percnopterus is largely wintering.

Juvenile White-backed vulture

Vultures were very common in India till the 1980s. During this period, the populations of the three resident Gyps species (OWBV, LBV and SBV) in the country was estimated at 40 million individuals. The overall population however crashed by over 90% during the mid-nineties. By 2007, 99% of the three Gyps species had been wiped out.

The pattern of crash in the populations of RHV and EV was very similar to the three resident Gyps vultures. The RHV declined by 91% during the period 1990 to 2007 and EV by 80%. As of today, according to the IUCN Red Data Book, four resident species, OWBV, LBV, SBV and RHV, are Critically Endangered whereas, the EV is Endangered, the HV, CV and BV are Near Threatened and EG is of Least Concern.

DRASTIC DECLINE IN VULTURE POPULATION



The crash in vulture populations came into limelight in the mid-nineties, and in 2004 the cause of the crash was established as diclofenac, a veterinary NSAID. Soon after, the Ministry of Environment, Forest & Climate Change (MoEFCC), Government of India, acted swiftly and released the Action Plan for Vulture Conservation (APVC) 2006, to save the vultures from possible extinction. The APVC 2006 had the following major objectives for the conservation of vultures in the country:

A. Removing the main causative agent for vulture mortality – diclofenac
B. Curbing leakage of human formulation of diclofenac into the veterinary sector
C. Monitoring conservation and recovery of vulture sites
D. Setting up and expanding vulture care and breeding centre
E. Controlling further mortality
F. Raising awareness especially among

users of veterinary formulation
G. monitoring implementation of Action Plan

The MoEFCC, with the coordination of State Forest Departments and Bombay Natural History Society (BNHS), took measures to implement the Action Plan and succeeded in arresting the decline in the vulture populations by 2011.

With respect to objective A and B of the APVC 2006, the Drug Controller General of India (DCGI) banned the veterinary use of diclofenac in the year 2006, which was gazetted in 2008 based on scientific evidence produced by MoEFCC, BNHS and international conservation organizations. In 2015, the DCGI, on the advice of MoEFCC based on scientific evidence, also restricted the vial size of the human formulation of diclofenac to prevent its misuse in treating cattle.

For objective C, the vulture populations were monitored throughout the country by conducting nation-wide road transect surveys, once in four years, and the latest survey has shown that the overall population is stabilising and that of OWBV could be increasing.

As part of objective D, the Central Zoo Authority (CZA) and BNHS led the establishment of the Vulture Conservation Breeding Programme. The Programme has been very successful; all the three Critically Endangered resident Gyps species have been bred for the first time ever in captivity. Eight centres have been established and so far 396 vultures of the three species have successfully fledged at the centres.

To achieve objective E, the Indian Veterinary Research Institute (IVRI) led a research study to identify a safe alternative to diclofenac by carrying out safety-testing of the shortlisted drug meloxicam on vultures, in collaboration with BNHS and The Royal Society for the Protection of Birds (RSPB), an international bird conservation organization based in the U.K. Meloxicam was proved to be safe for vultures and was promoted as an alternative to diclofenac. Further, the IVRI is leading the research on a MoEFCC-sponsored project on safety testing of veterinary NSAIDS available in the market on vultures. The safety testing of tolfenamic acid is being carried out on HV at Pinjore, Haryana. The drug appears to have no ill effect, so far, on vultures.

For objective F, the Vulture Safe Zone programme is being implemented at eight different places in the country where there were extant populations of vultures, including two in Uttar Pradesh that share the borders with Nepal. Attempts are made to secure the population of vulture by ensuring the minimum use of the drug diclofenac. This is achieved by carrying out targeted advocacy and awareness programmes with stakeholders. The conservation efforts are evaluated by monitoring the vulture populations and the prevalence of vulture toxic drugs. The area is declared a Vulture Safe Zone only when no toxic drugs are found in undercover pharmacy and cattle carcass surveys, for two consecutive years, and the vulture populations are stable and not declining.

Finally, for objective G, a National Vulture Recovery Committee (NVRC) has been constituted by MoEFCC under the Chairmanship of the Additional Director General of Forests, Wildlife, MoEFCC, Government of India, to monitor the implementation of the Vulture Action Plan.

The vulture populations in the country are, however, still not safe. The populations are precariously small and remain vulnerable to adverse events till their numbers have increased substantially. This vulnerable period will be lengthy because of the low natural reproductive capacity and long duration of

Therefore, there is a need to revise the action plan for the conservation of vultures, which would require continuation of the current actions and expanding the scope of some objectives.

immaturity of vultures, which means that, even under the most favourable conditions, the shortest period in which a wild vulture population can double in size is about ten years. The rate of the recent population decline was much more rapid than the fastest possible rate of increase, with the population of the species most strongly affected by diclofenac, halving every year. Even after the complete disappearance of diclofenac from the environment, conditions may not permit the maximum possible rate of recovery because of other problems caused by the vulture decline and effects of other NSAIDs.

The important objectives for the Action Plan for Vulture Conservation 2020-2025 (APVC) are:

1. Prevent the poisoning of the principal food of vultures, the cattle carcasses, with veterinary NSAIDs, by ensuring that sale of veterinary NSAIDs is regulated and is disbursed only on prescription and by ensuring that treatment of livestock is done only by qualified veterinarians.

2. Carry out safety testing of available molecules of veterinary NSAIDs on vultures. The new molecules should be introduced in the market only after they are proved to be safe following safety testing on vultures.

3. The DCGI must institute a system that automatically removes a drug from veterinary use if it is found to be toxic to vultures. Such a system would ensure that drugs other than diclofenac that are toxic to vultures like aceclofenac and ketoprofen are banned for veterinary use.

Formulations of vulture toxic veterinary NSAID diclofenac

4. There is a need to establish additional Conservation Breeding Centres in the country. Currently, there are 8 Vulture Conservation Breeding Centres in different parts of the country. While the primary focus of these centres is breeding of vultures, they also serve as Vulture Conservation Centres. For example, the in-situ conservation efforts are coordinated by the biologists based at the centres. The samples and information collected from the wild is analyzed and stored at these centres. Given that the centres have well-equipped facilities for veterinary care, laboratory, sample processing and storage facilities, they also help in identifying the cause of mortality in vultures in the region by providing all the necessary veterinary and laboratory support. Unfortunately, certain regions of the country cannot be fully covered by the existing network of breeding centres. It is therefore difficult to survey and collect samples from these areas due to their distance from the nearest centre. So it is proposed to set up one centre each in Uttar Pradesh, Tripura, Maharashtra, Karnataka and Tamil Nadu, which will cover most parts of the country.

5. The populations of RHV and EV have also crashed by over 80% over the years and it is important to set up a conservation breeding programme for these species. It is proposed to initiate the conservation breeding programme for RHV and EV in the Vulture Conservation Breeding Centres by creating additional infrastructure.

6. Four rescue centres have been proposed for different geographical areas like Pinjore in the north, Bhopal in Central India, Guwahati in Northeast India and Hyderabad in South India. The centres will be established 5km from the breeding centres such that veterinary expertise of the breeding centres could be utilized for treatment of sick and injured birds. There are currently no dedicated vulture rescue centres to treat vultures that get injured in accidents and fall sick by unintentional poisoning. Rescue centres will help in saving these vultures, and these could become part of the breeding programme or safety testing projects.

7. It is proposed to carry out coordinated nation-wide

vulture count to get a better estimate of the size of vulture populations in the country, involving Forest Departments, BNHS, Research Institutes, NGOs, and ordinary citizens. The count will be carried out on a pre-determined day across the country in the month of February, once in four years.

8. It is proposed to have at least one vulture safe zone in each State for the conservation of the remnant populations in that State. The vulture safe zone shall be created ensuring low prevalence of toxic NSAIDs in an area of 100 km radius from the vulture colony through targeted advocacy and awareness programmes following the established protocol. This will help in the conservation of vultures across the country with participation of people and communities.

9. It is proposed to gather information of other emerging threats to vulture conservation such as:

A. COLLISION AND ELECTROCUTION

The power infrastructure in the country is developing rapidly and the spread of power lines has become very extensive. It has caused problems to large birds of prey including vultures, globally. The issue therefore needs to be addressed. It is proposed that information shall be collected on the spread of power infrastructure in vulture habitats. Guidelines shall be obtained from International experts and would be shared with local authorities to carry out vulture-friendly modifications. Similar efforts shall be made to mitigate the harm caused by the wind turbines. A national database shall be created and incidences of mishaps shall be recorded.

B. UNINTENTIONAL POISONING OF CARCASSES

Unintentional poisoning also causes fatalities in vultures. Though not very widespread and significant now, it could become a serious problem for vulture conservation with increasing human-animal conflicts. It is proposed that information shall be gathered on the occurrence of poisoning incidences and a national database shall be created. The possibility of regulating the use of potent agriculture pesticides to prevent such happenings shall also be looked into.

A NVRC, headed by the ADG (Wildlife) is in place to monitor the implementation of the APVC 2020-2025. The APVC will also seek expertise and advice from the existing Regional Steering Committee (RSC) for Coordination of various countries in South Asia that are within the distribution range of the vultures (and can meet every year), as well as from SAVE (Saving Asia's Vultures from Extinction), a consortium of NGOs, NGIs (Non-government individuals), Government organizations and International Conservation Organizations, which are actively working for the conservation of South Asian Vultures. The APVC will also draw support from Multi-Species Action Plan (MsAP) of Raptor MOU and CMS (Convention of migratory species).

As mentioned earlier in the summary, the APVC 2020-2025 covers all the nine species of vultures recorded from India. Five are of genus Gyps, including the residents, OWBV, LBV, SBV and the wintering HV and EG. The rest of the species are monotypic including the resident RH, EV and BV. The time period for the implementation of the APVC is from 2020 to 2025. The APVC will be extended for another five years after 2025 following a critical evaluation of the implementation of the key objectives or the action points.

A detailed mid-term review of the APVC will be carried out during the year 2022-2023 under the Chairmanship of IG (Wildlife) with a three-member expert committee appointed from the NVRC.

A Juvenile Long-billed vulture

Adult White-backed vulture

CHAPTER I

Overview of Status and Conservation of Vultures in India

A. INTRODUCTION

There are twenty-three species of vultures in the world, found in North America, South America, Africa, Europe and Asia. Australia lacks vultures. Sixteen species are reported from the old world and seven from the new world. The name condor is given to the two American vultures – the Californian and the Andean. Of the 16 species of vultures of nine genera recorded from the old world, eight species belong to the genus Gyps. All are representatives of the Old World vultures, which are placed within the family Accipitridae and order Accipitriformes (BirdLife International 2014). Vultures are also birds of prey as they have highly specialized musculature in their feet, though now degenerated because they have taken to entirely scavenging way of life.

Till a couple of decades ago, all the Old World vultures had comfortable population status but it changed dramatically and by the year 2015, eight out of 16 species were Critically Endangered (indicating possibility of their going extinct within 10 years), three were Endangered and four Near Threatened and only one was of Least Concern based on International Union for Conservation of Nature and Natural Resources (IUCN) Red list. Unless effective conservation actions were implemented in the distribution range of these birds, there was a strong likelihood that several of these species could become extinct in the near future. The main reason for the rapid population declines of vultures is largely because of poisoning of their food, both intentional and otherwise.

The population of some species have shown recovery, like EV, BV and CV, thanks to intensive conservation efforts in Europe (Margalida and Oliva-Vidal 2017). Other threats to vultures, operating variably in different regions of the world, include such problems as habitat loss or degradation (Carette et al. 2007), food availability, collisions (Carette et al. 2012), and electrocution by electricity power lines (Anderson and Kruger, 1995; Boshoff et al., 2011).

Nine species of vultures are recorded from India, of which five are of Genus Gyps, including the resident OWBV, LBV, SBV and largely wintering, HG and EG. Rest of the species are monotypic including the resident RHV, EV, BV, and the wintering CV. A sub-species of EV *Neophron percnopterus percnopterus* is largely a long distance migrant (Ali and Ripley 1983).

Vultures were seen in huge numbers at carcass disposal sites till late eighties (Photo: Goutam Narayan)

All the species of vultures are scavengers and are commensal of man. The Gyps species of vultures occurred in very high densities in India because of the availability of abundant food supply due to the primitive method of carcass disposal in the country. All of them have successfully exploited the vast food resource created by the people due to extensive dairy farming. The carcasses of livestock form the principal food for vultures and are now mostly dependent on human activity for their food.

During the 1980s, the OWBV was thought to be the commonest large bird of prey in the world (Houston 1985). The populations of five species of vultures since the mid-1990s declined rapidly throughout South Asia (Prakash et al. 2003, 2007, Gilbert et al. 2002, 2007,

Table 1. Status of Vultures in India *(Prakash et al 2017)*

Species	Resident/ Migratory	Conservation (Global)	Status Conservation (Wildlife Protection Act 1972)	Estimated Population in India
Bearded (BV)	Resident	Near Threatened	Schedule-I	Not available
Cinereous (CV)	Winter visitor	Near Threatened	Schedule-IV	Not available
Egyptian (EV)	Resident	Endangered	Schedule-IV	Not available
Eurasian (EG)	Winter visitor	Least Concern	Schedule-IV	Not available
Himalayan (HV)	Winter/resident	Near Threatened	Schedule-IV	Not available
Long-billed (LBV)	Resident	Critically endangered	Schedule-I	26,500
Red-headed (RHV)	Resident	Critically endangered	Schedule-IV	Not available
Slender-billed (SBV)	Resident	Critically endangered	Schedule-I	1,000
Oriental White-backed (OWBV)	Resident	Critically endangered	Schedule-I	6,000

Several species of vultures congregate on animal carcasses and feed cooperatively

Green et al. 2004, Cuthbert et al. 2006, Chaudhary et al. 2012). Between 1992 and 2007, the population of OWBV declined by > 99.9% and the LBV and SBV combined together declined by 96.8% (Prakash et al. 2007). Similarly, the populations of RHV crashed by 91.0% and that of EV by 80.0% during 1991 to 2003 (Cuthbert et al. 2006a).

Based on these changes, four of these species were listed as 'Critically Endangered' on the IUCN Red List and the EV as 'Endangered' (IUCN 2013). The HV, CV and BV are listed as "Near Threatened" and EG as "Least Concern".

The major cause of crash in vulture populations was found to be the veterinary use of non-steroidal anti-inflammatory drug (NSAID) diclofenac. This drug was found to be highly toxic to Gyps vultures (Oaks et al. 2004, Swan et al. 2006a). When a vulture feeds on the carcass of a livestock which died shortly after it was treated with diclofenac, it gets exposed to the drug. (Oaks et al. 2004, Swan et al. 2006a).

Green et al. (2004) estimated that less than 0.8% of ungulate carcasses available to foraging vultures would need to contain a lethal dose of diclofenac to have caused the observed population declines. The analysis of the liver samples collected across the country, from domestic ungulate carcasses, between the years 2004 and 2005 showed, that proportion of animals contaminated with diclofenac were sufficient to have caused the vulture population crash at the observed rates (Green et al. 2007).

B. THE ROLE OF VULTURES IN ECOSYSTEM

They are nature's most efficient scavengers and can finish off a carcass of an adult cattle in a matter of minutes (Ali and Ripley 1983). The vultures once kept the environment clean in India in the absence of any effective carcass and slaughter house waste disposal system (Grubh 1989). They prevented the outbreak of epidemics by cleaning the carcasses before pathogenic bacteria and fungus could grow and multiply on them. The vultures are known to feed on rotting and putrefied

Till a couple of decades ago, all the Old World vultures had comfortable population status but it changed dramatically and by the year 2015, eight out of 16 species were Critically Endangered (indicating possibility of their going extinct within 10 years)

flesh without any adverse effect on them. Now, with the absence of vultures, the accumulation of livestock carcasses may have implications for groundwater safety and for livestock-borne diseases such as tuberculosis and anthrax. With the decline in the numbers of resident vulture species, there is now an abundance of food (Prakash et al. 2003).

Concurrently, and probably in response to the increased food availability, there appears to be an increase in resident feral dog populations, which could have serious consequences for human and wildlife health as dogs are carriers of several diseases that affect human beings, wildlife and livestock, including rabies, distemper and canine parvovirus (Pain et al. 2003).

India has the highest incidences of rabies in humans in the world, with the majority of these from dog bites (Prakash et al. 2004).

Vultures are not only important for environmental health, but also have considerable cultural and religious significance in India and elsewhere. For thousands of years, and in different parts of the world, humans have laid out their dead to be consumed by scavengers. Of these, the best known and documented are the Parsees (Boyce 1979).

The Parsees believe that fire, earth and water are sacred and, as such, must not be contaminated with human corpses, e.g. by burial, cremation or disposal in water. The Parsees, therefore, ritualized the practice of putting out the dead for scavengers by building 'towers of silence' to limit access to corpses exclusively to airborne scavengers.

Increase in feral dog populations have serious consequences for human and animal health (Photo: Kartik Shastri)

Collecting cattle bones for the fertilizer industry was an age old trade and vultures effectively and rapidly 'cleaned' skeletons of all soft material and facilitated the bone collectors' job.

As it became evident that the vulture populations had crashed and they were on the verge of extinction, the Government of India took rapid action and prepared an Action Plan for Vulture Conservation in India, 2006 for the conservation of vultures in the country (MoEF, Government of India 2006). ■

Vultures provide ecosystem services by efficiently clearing up carcasses

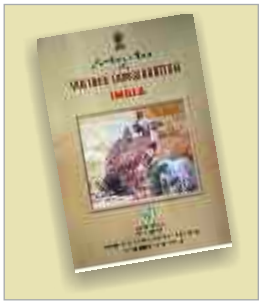
Juvenile White-backed vulture

CHAPTER II

The Review of Action Plan for Vulture Conservation in India, 2006

A. INTRODUCTION

The Government of India released the first Action Plan for Vulture Conservation (APVC) in 2006, which had incorporated most of the findings and recommendations of the International South Asian Vulture Recovery Plan Workshop, 2004 (ISARPW 2004). The plan was released largely in response to the catastrophic crash in the population suffered by the three most numerous resident Gyps species of vultures in India, largely due to the veterinary use of the drug diclofenac. The APVC advised certain urgent conservation measures to save the three Critically Endangered species from looming extinction. The Action Plan was formulated for the period 2006 to 2009.



B. MAJOR OBJECTIVES OF APVC 2006

1. Removal of the Main Causative Agent for vulture mortality– diclofenac
2. Curbing Leakage of Human Formulations of diclofenac into the Veterinary Sector
3. Monitoring conservation and Recovery of Existing Vulture Sites
4. Setting up and Expansion of Vulture Care and Breeding Centres
5. Control of further mortality
6. Raising Awareness especially among Users of Veterinary Formulations
7. Monitoring Implementation of Action Plan

Conservation actions taken to achieve the objectives of the APVC 2006 resulted in the following major accomplishments:

Veterinary formulations of vulture toxic NSAID diclofenac

OBJECTIVE 1.
REMOVAL OF THE MAIN CAUSATIVE AGENT FOR VULTURE MORTALITY– DICLOFENAC

The veterinary drug diclofenac was established as the cause for the crash of vulture populations in India. Vultures got exposed to the drug when they fed on a carcass of a livestock that died within 72 hours of its administration. Diclofenac caused renal failure resulting in the mortality of vultures. So it was imperative that the drug be removed from the major food of vultures i.e. the cattle carcasses, to save them from possible extinction. The following actions were taken for the removal of diclofenac from vulture food:

a. BAN OF THE VETERINARY USE OF DICLOFENAC

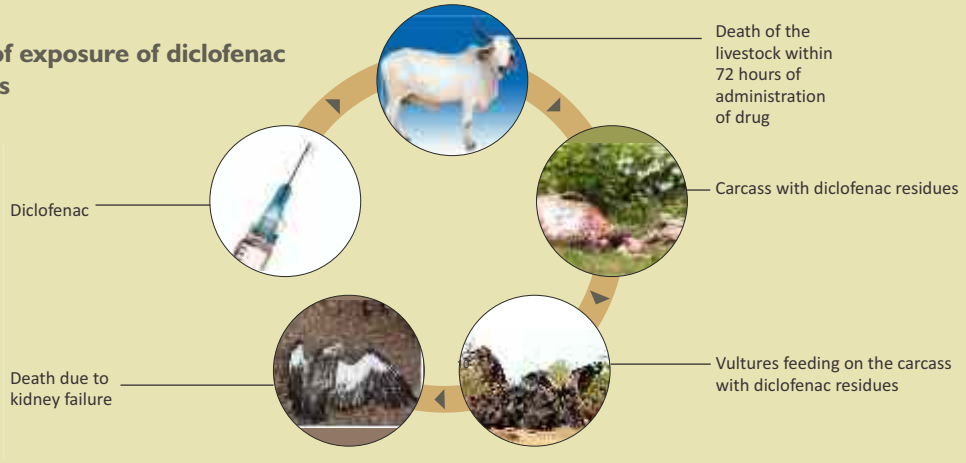
Scientific studies on diclofenac were carried out within the country and internationally, and the findings were published in high impact factor scientific journals (Oaks et al. 2004, Shultz et al. 2004). The Ministry of Health and Family Welfare (MoHFW), Government of India, took cognizance of the studies and in August 2006, the DCGI banned the use, sale and manufacture of veterinary diclofenac (Kumar 2006) and gave three months' time to implement the ban. The ban was gazetted in 2008 and it became a law (Gazette of India Notification No. GSR 499 (E)).

Safety testing of meloxicam on vultures at VCBC, Pinjore, Haryana

b. IDENTIFICATION OF A VULTURE SAFE DRUG AS AN ALTERNATIVE TO VETERINARY NSAID DICLOFENAC

A global search for the non-steroidal anti-inflammatory drugs (NSAIDs) used for treating raptors was carried in captive facilities for raptors and vultures, and meloxicam was shortlisted as a safe drug for vultures since it was found to have caused no mortality in raptors or vultures upon administration (Cuthbert et al. 2006b).

Pathway of exposure of diclofenac to vultures



Cattle carcass liver tissue sampling

A safety testing of the drug meloxicam was carried out on the resident Gyps vultures to find out if it was safe for vultures and could be a suitable alternative to diclofenac, the vulture killer drug. Meloxicam, like diclofenac, is an NSAID but is a selective COX inhibitor and hence has fewer side effects on the animal it is administered.

Meloxicam was first administered in South Africa to African White-backed Vulture *Gyps africanus* (AWBV), a surrogate species of Indian resident Gyps vultures, by gavage and through buffalo meat. There was no evidence of toxicity caused by the drug as the uric acid levels in plasma did not elevate.

Finally, ten individuals from two of the critically endangered vulture species (OWBV and LBV) were given meloxicam by gavage, five of them at a dosage above the Maximum Level of Exposure (MLE) at the vulture centre in Pinjore, Haryana. All survived with no obvious ill effects, as did the other 21 birds (OWBV and LBV) fed on muscle or liver tissue from water buffalo treated with double the standard veterinary dose of meloxicam until eight hours before slaughter (Swan et al. 2006b, Swarup et al. 2007).

Diclofenac: Single-dose ampoule of 3ml of human formulation

The results of these studies suggested that meloxicam was of low toxicity to Gyps vultures and, that in this respect, it would be a suitable substitute for diclofenac. Meloxicam also appears to have very low toxicity to a wide range of other raptors and scavenging birds that may encounter carcasses.

This was proved when over 700 individuals from 54 species were clinically treated with meloxicam and a further 5 species were dosed with meloxicam at dosages above MLE (Cuthbert et al. 2006b, Swarup et al. 2007).

Like diclofenac, meloxicam is out of patent, licensed for veterinary use in India, already produced for veterinary use in injectable and bolus (ingestible) form, and considered a very effective NSAID (Noble and Balfour 1996, Del Tacca et al. 2002, Deneuche et al. 2004) to treat a variety of livestock ailments (Friton et al. 2004, Hamman and Friton 2003, Milne et al. 2003).

The Government of India, in its notification of the ban on veterinary use of diclofenac, also mentioned that meloxicam should be used instead for treating inflammation and pain in cattle as it was found safe to vultures. This went a long way in reducing the use of vulture toxic drug diclofenac in treating cattle and making vulture food safe. (Appendix II)

OBJECTIVE 2.
CURBING LEAKAGE OF HUMAN FORMULATIONS OF DICLOFENAC INTO THE VETERINARY SECTOR

To curb the infiltration of human formulations into veterinary sector, the following actions were taken:

a. RESTRICTIONS ON THE VIAL SIZE OF HUMAN FORMULATIONS TO 3ML

It was observed that despite the ban on the veterinary use of diclofenac, the drug was still being used and the vultures were dying of diclofenac poisoning (Cuthbert et al. 2015). This happened because the human formulations of the drugs were available in multi-dose vials of 30, 50 and 100 mL and were being misused in

Undercover pharmacy survey

treating cattle and livestock (Cuthbert 2011). The Government of India restricted the vial size of the drug diclofenac to 3mL to prevent its misuse in treating livestock by issuing an Extra-ordinary Gazette Notification in the year 2015 (Appendix-III). This would ensure bringing down the prevalence of diclofenac in veterinary use.

b. MONITORING THE PREVALENCE OF NSAIDS IN VETERINARY USE

i. CATTLE CARCASS LIVER TISSUE SAMPLING

To evaluate the effectiveness of the actions taken to prevent the leakage of the human formulations of diclofenac in veterinary use, prevalence of diclofenac in cattle carcasses available to vultures was estimated. The prevalence in the food of vultures was monitored by carrying out cattle carcass liver sampling from different parts of the country. This was repeated every four years to get an idea of the trend in the use of various veterinary drugs in treating livestock. A total of 2000 liver samples from cattle carcasses, which were available to vultures for foraging across the country, were collected every four years from the year 2005 onwards to determine the prevalence of diclofenac in the environment.

The prevalence of the drug in cattle carcasses steadily went down after the ban on the veterinary use of diclofenac. A total of 10.1% of the carcasses were recorded to have residues of the drug diclofenac in the

Monitoring vulture population trends across the country

year 2005-06, just before the ban on the veterinary drug (Taggart et al. 2007), which reduced to less than 2% by the year 2013 except for Rajasthan where it was still over 5% (Cuthbert et al. 2011; 2014, Saini et al. 2012). Based on the mathematical modeling, the prevalence of less than 1% in cattle carcasses was considered safe for the vulture populations (Green et al. 2004).

ii. UNDERCOVER PHARMACY SURVEYS

To evaluate the effectiveness of action taken for preventing the leakage of human formulation into veterinary sector, undercover pharmacy surveys were carried out. The surveys in different parts of the country revealed a drop in the use of diclofenac in most of the places and an increasing popularity of the drug meloxicam in veterinary use was recorded (Cuthbert et al. 2011). There was, however, an increase in the use of

other untested NSAIDs that were probably toxic to vultures like the nimesulide. Also, there was still some leakage of single dose ampoules of human formulation of diclofenac for veterinary use.

The surveys carried out, in 2018-19 in the release zone of 100 km radius from Vulture Conservation Breeding Centre, Pinjore, revealed that meloxicam had become the drug of choice as over 60% chemists sold only meloxicam for treating pain and inflammation in the cattle (BNHS unpublished Report 2019) and only 3% chemists sold the 3 mL ampoules for human use. Similarly, in the proposed Vulture Safe Zone, in a radius of 100 km from Majuli Island in upper Assam, none of the pharmacists sold diclofenac for veterinary use (BNHS unpublished Report 2019).

OBJECTIVE 3: MONITORING CONSERVATION AND RECOVERY OF EXISTING VULTURE SITES

Three methods were applied to estimate the trends in the existing population of vultures of various species:

a. MONITORING TRENDS IN VULTURE POPULATIONS ACROSS THE COUNTRY

To monitor the vulture populations, nation-wide surveys were carried out by BNHS in collaboration with State Forest Departments and MoEF&CC on predetermined transects. The vultures were counted on road transects widely distributed across northern, central, western and north-eastern India. Transects were positioned in and near protected areas and also along roads distant from protected areas. Every year the same transects were followed but some new transects were added as required. The transects were repeated every four years to get an idea of the population trends. The approximate length of transects driven was over 18,800 km.

This method gave a good indication of population trends across the country Prakash et. al. 2003, 2007, 2019. Based on these surveys, the crash in the resident Gyps vulture populations could be documented. The surveys revealed that the populations of the OWBV, LBV and SBV declined rapidly during the mid-1990s all over their ranges in the Indian subcontinent because of poisoning due to veterinary use of the non-steroidal anti-inflammatory drug diclofenac. The populations of OWBV declined by 99.9% and of LBV and SBV by over 96.8% by the year 2007 (Prakash et al. 2007).

Ten years later, Prakash et al. (2017) reported that populations of all three species of vultures remained at a low level. The previously recorded rapid decline of OWBV has slowed and may have reversed since the ban on veterinary use of diclofenac in 2006. A few thousands of this species, possibly a low tens of thousands, remained in India in 2015. The population of LBV continued to decline, though probably at a much slower rate than in the 1990s. This remains the most numerous of the three species in India, with about 12,000 individuals in 2015.

b. TOTAL COUNT OF VULTURES IN DIFFERENT STATES

The vulture populations were also monitored in some States by the Forest Departments in collaboration with the local NGOs and research institutions. In certain others, the population was monitored by BNHS or by local NGOs.

The Forest Department of Gujarat and Madhya Pradesh have carried out systematic monitoring of vulture populations in their states:

i. POPULATION MONITORING OF VULTURES IN GUJARAT

This is the only State in the country where systematic monitoring is being carried out. The Forest Department of Gujarat in collaboration with the Gujarat Ecological Education and Research Foundation (GEER), an autonomous organization of Gujarat Forest and Environment Department of Government of Gujarat, has been monitoring since 2005.

Total district-wise counts are carried out once in 2-3 years across the State. The surveys were coordinated by GEER Foundation and Gujarat Forest Department and were carried out by Forest Department staff and NGOs, NGIs (Non-government individuals) and

members of the public after a couple of days of intensive training provided. The most recent vulture population estimation in Gujarat State was carried out in early June 2018. Kamboj et. al. 2019. A decline of 75.8% in the Gyps vulture population was recorded in the State between 2005 and 2018.

ii. POPULATION MONITORING OF VULTURES IN MADHYA PRADESH

The population of vultures was monitored in the entire State of Madhya Pradesh by the State Forest Department during 2017-18 and 2018-19.

The surveys were coordinated by Madhya Pradesh Forest Department and Indian Institute of Forest Management, Bhopal and were carried out by Forest Department staff, NGOs, NGIs and members of the public.

The teams of local staff and NGOs were provided with intensive training in identification for a couple of days. Existing vulture sites were identified and then, on a pre-decided single day in winter and summer, the adults and juveniles of different species of vultures were counted. The most recent vulture population estimation in Madhya Pradesh was carried out in early 2019 and a total of 7970 vultures of seven species were sighted, giving a 12% increase in the total populations (Jha 2017).

iii. POPULATION MONITORING OF VULTURES BY NON-GOVERNMENTAL ORGANIZATIONS

The vulture population monitoring is being carried out by various NGOs in South India (Ramakrishnan 2018) including Malabar Natural History Society, Kannur in Kerala; ATREE and NGI Mr. Chandrashekar S, in Moyar Valley in Tamil Nadu; Nature Conservation

Awareness programmes with various stakeholders are integral to vulture conservation

Foundation, Mysore and Save Tiger First, Bangalore, both in Karnataka and Centre for Cellular and Molecular Biology, Hyderabad in Telangana.

The BNHS is carrying out vulture population monitoring at Bundelkhand in Madhya Pradesh, around Kaziranga National Park in Upper Assam, near Pinjore in Haryana, and around Buxa Tiger Reserve in West Bengal, where there has been a population of free ranging vultures.

OBJECTIVE 4. SETTING UP AND EXPANSION OF VULTURE CONSERVATION BREEDING CENTRES

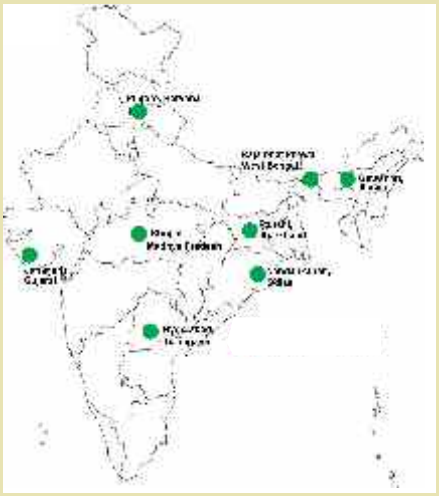
A conservation breeding programme for the three resident Gyps species of vultures was set up in 2004 to implement the recommendation of the ISARPW 2004 and Action Plan for Vulture Conservation 2006 (MoEF, Government of India 2006).

There are in all eight Vulture Conservation Breeding Centres (VCBC) established in the country. The first VCBC was set up in 2004 at Pinjore in Haryana by Forest Department of Haryana and BNHS. Subsequently, a centre was set up at Rajabhatkhawa in West Bengal in 2006 and another at Rani in Assam in 2008. Five centres were set up by the Central Zoo Authority in collaboration with the State Zoos at Van Vihar, Bhopal, Madhya Pradesh; Nandankanan Zoo, Bhubaneshwar, Odisha; Nehru Zoological Park, Hyderabad, Telangana; Muta Zoo, Ranchi, Jharkhand and Sakkarbagh Zoo, Junagadh, Gujarat.

The VCBC, Pinjore is recognised as the coordinating zoo for vulture conservation in India. The centre has produced a 'Manual' in collaboration with the CZA for the Conservation Breeding Programme, which gives a systematic and step-wise method for setting up a VCBC and running the centre on a day-to-day basis (Prakash et al. 2012) (For details see Appendix IV).

The objective of the centres were to house 25 pairs of each of the three species which had their distribution in the location of the centre and release 100 pairs of each of the housed species, 10 years from the start of the release programme.

Locations of Vulture Conservation Breeding Centres in the country



The centres collected 75% of the founder population as first year birds in order to have birds of a known age, as it is not possible to age the vultures beyond 5 years. The birds reach adulthood only after 5 years. The birds of F1 generation were also utilized as founder stock and F2 generation birds for release. By the year 2020, over 730 birds were housed in all the eight VCBCs in the country including 363 WBV, 262 LBV and 106 SBV.

The eight centres are distributed over most of the geographical area of the country. There is, however, only one centre in North-East and one in South India. Though the primary objective of the VCBCs is breeding the Critically Endangered vultures, due to the facilities, infrastructure and capacities developed over the years, the centres help in-situ conservation efforts of vultures as well.

The VCBCs also at as training facilities for biologists who want to work on vulture conservation. The training on identification of vultures, sample collection techniques and survey methods are imparted because of the availability of expertise. The biologists working on in-situ conservation of vultures

Table 2: Total Number of vultures housed at Vulture Conservation Breeding Centres in 2019-2020

Species	Pinjore	Rajabhatkhawa	Rani	Bhopal	Hyderabad	Junagarh	Nandankanan	Muta	Total
Oriental White-backed Vulture	115	87	76	18	11	56	0	0	363
Long-billed Vulture	175	27	0	37	0	5	18	0	262
Slender-billed Vulture	43	17	46	0	0	0	0	0	106
Total	333	131	122	55	11	61	18	0	731

are based at the VCBC and monitor the vulture populations and nesting colonies and the prevalence of various NSAIDs by carrying out cattle carcass sampling and pharmacy surveys.

The centres also help in determining the cause of mortality in free ranging vultures in the wild by providing veterinary support to post mortems and analysing tissue samples. These facilities are not available anywhere in the country. Hence, it is important that the Vulture centres are conveniently located as that would make it easy to take comprehensive conservation measures for vultures. There is a need to increase the number of centres.

OBJECTIVE 5: CONTROL OF FURTHER MORTALITY

The following actions were initiated to control further mortality in vulture populations:

a. *SAFETY TESTING OF VARIOUS VETERINARY NON-STEROIDAL ANTI-INFLAMMATORY DRUGS, APART FROM DICLOFENAC, AVAILABLE IN THE MARKET TO IDENTIFY THEIR TOXICITY TO VULTURES*

Of the nearly 14 different veterinary NSAIDs available for treating domestic animals, only meloxicam has been established as safe for vultures. But the other drugs, of unknown toxicity to vultures, are still widely

Table. 3 Total Number of vultures fledged at Conservation Breeding Centres till 2019

All the species have bred successfully at the four centres and in all 396 vultures have so far hatched and fledged at the centres.

Species	Pinjore	Rajabhatkhawa	Rani	Bhopal	Total
Oriental White-backed Vulture	94	48	31	02	175
Long-billed Vulture	150	14	00	06	170
Slender-billed Vulture	30	06	15	00	51
Total	274	68	46	08	396

used to treat cattle. The IVRI and BNHS are working on a project funded and supported by MoEFCC, Government of India to safety test all the untested drugs on vultures. Apart from diclofenac, aceclofenac and ketoprofen were also found to be toxic to vultures in South Africa (Naidoo et al. 2010; Galligan et al. 2016); nimesulide and flunixin could be toxic (Cuthbert et al. 2015; Fourie et al. 2015). If a drug is found toxic, then it would be recommended to the Government of India to ban its veterinary use to prevent vulture mortality. The safety testing of tolfenamic acid was started during 2018-19.

b. COLLECTION OF DEAD VULTURES TO FIND THE CAUSES OF MORTALITY

i. NSAID-RELATED MORTALITY

The vultures found dead in different parts of the country were collected and transported on cool packs to VCBC, Pinjore with the permission of MoEF&CC. Post mortems were carried out at VCBC Pinjore to find the cause of mortality. The presence of various NSAIDs were checked in their tissues, especially in the liver and kidney, by standard methods (Taggart et al. 2007). Diclofenac was found to be responsible for mortality in most cases and it was associated with visceral gout. The human formulations of diclofenac were observed to be illegally sold for veterinary use.

The results of 62 necropsies and 48 NSAID assays of liver and/or kidney of vultures of five species found dead in India between 2000 and 2012 were analyzed (Cuthbert et al. 2015).Visceral gout and diclofenac were detected in three species OWBV, LBV, and HV from nine States. The visceral gout was found in every vulture carcass in which a measurable level of diclofenac was detected. Meloxicam, an NSAID of low toxicity to vultures, was found in two vultures and nimesulide in five vultures. Nimesulide at elevated tissue concentrations was associated with visceral gout in four of these cases, always without diclofenac, suggesting that nimesulide may have similar toxic effects as diclofenac. Residues of meloxicam on its own were never associated with visceral gout. The proportion of Gyps vultures found dead in the wild in India with measurable levels of diclofenac in their tissues showed a modest and non-significant decline since the ban on the veterinary use of diclofenac.

The prevalence of visceral gout declined less, probably because some cases of visceral gout from 2008 onwards were associated with nimesulide rather than diclofenac. Veterinary use of nimesulide is a potential

Isolated or scattered mortality in vultures happen when they feed on a toxic NSAID laced carcass

threat to the recovery of vulture populations. The IVRI is continuing the safety testing of nimesulide on Himalayan Griffon and if found toxic, efforts will be made to ban it for veterinary use.

ii. OTHER CAUSES OF MORTALITY

The presence of other diffused pollutants were also analyzed in the dead vultures at Sálim Ali Centre for Ornithology and Natural History, Coimbatore (SACON), Tamil Nadu to determine the causes of mortality in vultures (Dhananjayan and Muralidharan 2013). The presence of organochlorine pesticide, polychlorinated biphenyls, polycyclic aromatic hydrocarbons and heavy metals was determined to find out if they were also cause of mortality in vultures. Varying concentration of referred chemicals were detected in all the species of vultures including OWBV, EG, HG, EV collected from Gujarat, Tamil Nadu, Assam, Delhi and Punjab. However, none of the vultures had levels indicative of poisoning (Dhananjayan and Muralidharan 2013).

iii. UNINTENTIONAL POISONING

The vultures fall victim to unintentional or retaliatory poisoning when a cattle owner or farmer stuffs the carcass of his cattle, which was killed either by feral dogs or by wild predator, with organo-chlorine or organophosphate (Ali et al. 2017). Unintentional poisoning is reported mainly in winter and spring seasons from December to May usually after harvesting of paddy. In the last 9 years, there were 42 reports of vulture poisoning in 11 districts of Assam and a total of 622 vultures died. They were mostly HV, CV, OWBV and SBV.

The poisoning incidences are few and far between and they do not appear to be responsible for the crash in vulture populations. The NSAID poisoning is very widespread and causes very heavy mortality in vultures including in adults, which caused the crash in vulture populations.

The mortality of vultures due to NSAID poisoning is never very dramatic unlike in the case of poisoning by organo-phosphate, as vultures are never seen lying dead around the carcass. However, the population of vultures is so low that even occasional unintentional poisoning of carcasses could cause local extinctions and should be prevented.

Number of vultures die around the carcass after retaliatory/unintentional poisoning

Juvenile Long-billed vulture

Creating awareness among the cattle owners is the only way to prevent deliberate poisoning aimed towards eliminating problematic large carnivores. The Assam Forest Department and BNHS organizes awareness programmes around the site of poisoning and tries to impress upon the people the importance of vulture conservation.

The Forest Department also takes action against the person who deliberately poisons carcasses. A major problem is the easy availability of very potent agricultural pesticides like Carbamates (Furadon). The organophosphates like phorate, phosphamidon, malathion and monocrotophos are also used in the country for retaliatory poisoning.

There is a need for the strict implementation of the Insecticide Act 1968 to regulate the use of pesticides. It is important that the potent pesticides used in tea gardens do not reach the locals for agriculture use, which also results in deliberate poisoning of livestock carcasses for killing the rogue predator.

iv. ESTABLISHING VULTURE SAFE ZONES IN DIFFERENT PARTS OF THE COUNTRY FOR CONSERVATION OF THE REMNANT POPULATION OF VULTURES

India is a huge country and despite ban on veterinary diclofenac, removal of the drug from vulture food across the country has been a daunting task. However, if efforts are concentrated in areas where remnant populations of the vultures are present, then it is possible to minimize the use of the toxic drug.

To achieve this, Vulture Safe Zone (VSZ) programme was initiated in 2012 by the State Governments in collaboration with BNHS and other NGOs; the aim was to save the remnant populations of vultures by eliminating diclofenac in their food in an area of at least 100 km (30,000 sq. km) radius with extant vulture population through advocacy and awareness efforts. (Also refer to Appendix VI)

The work towards creating VSZ is going on at eight different locations in the country. The baseline information on the existing population of vultures in the area, the prevalence of diclofenac and other NSAIDs in veterinary use and the availability of food for vultures was initially collected.
Targeted awareness and advocacy programmes with various stakeholders were then carried out across the vulture safe zones. This included meetings with the decision makers of various departments at the various levels of administration.

The decision makers were sensitized on various aspects of vulture conservation through research articles and notification from the Government of India. Subsequently, the monitoring of vulture populations,

The mortality of vultures due to NSAID poisoning is never very dramatic unlike in the case of poisoning by organo-phosphate, as vultures are never seen lying dead around the carcass. However, the population of vultures is so low that even occasional unintentional poisoning of carcasses could cause local extinctions and should be prevented.

prevalence of veterinary NSAIDs and food and habitat availability were estimated to study the impact of targeted advocacy and awareness programmes.

The population of vultures appeared to have stabilized in most of the VSZ and the prevalence of vulture toxic drug was observed to have reduced over the years. Regular monitoring of these zones would be required for at least five years once no diclofenac is found for veterinary use and no drug-related vulture mortality is recorded for two years.

OBJECTIVE 6. RAISING AWARENESS ESPECIALLY AMONG USERS OF VETERINARY FORMULATIONS

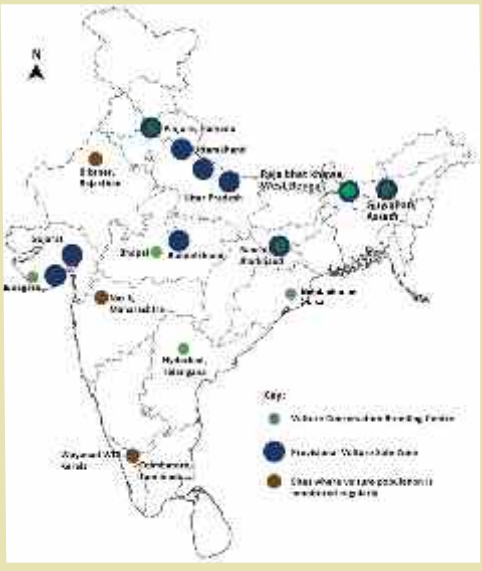
It is imperative to have an awareness campaign on the importance of vultures in the ecological cycle. Conservation efforts would be incomplete without the participation of local people, a fact that has been emphasized in the Wildlife (Protection) Act, 1972 as well as in the National Wildlife Action Plan (2002-2016). Participation of local people in conservation would only materialize if they are aware of the ongoing crisis and the steps they need to take for conservation. Such campaigns should also have demonstrations on safe means of disposal of carcasses.

MoEFCC sponsored films 'The Last Flight' and 'Vanishing Vultures' are frequently telecasted on radio and television in order to raise awareness on vulture conservation. States have been requested to develop education and awareness materials, keeping the Animal Husbandry sectors and farmers in mind.

The BNHS carries out intensive awareness programmes in identified Vulture Safe Zones and also around Vulture Conservation Breeding Centres with the help of awareness material produced by the Society for different stakeholders. NGOs like Arulagam in Tamil Nadu, Corbett Foundation in Gujarat & Madhya Pradesh, Neo Human Foundation in Jharkhand and GEER Foundation in Gujarat are also carrying out extensive awareness programmes for vulture conservation. The media, both print and visual, is also proactive in publicizing the problem of vulture decline and its causes.

Locations of Provisional Vulture Safe Zones

Locations of VCBC, Vulture Safe Zone and Vulture monitoring areas in the country



OBJECTIVE 7. MONITORING IMPLEMENTATION OF APVC 2006

A National Vulture Recovery Committee (NVRC) was constituted by MoEF&CC under the Chairmanship of Additional Director General of Forest (Wildlife) and its first meeting was held on 22 October 2016 with the following members:

1. Director, Wildlife Institute of India, Dehradun
2. Member Secretary, Central Zoo Authority, New Delhi
3. Drug Controller General of India, Ministry of Health and Family Welfare, New Delhi
4. Chief Wildlife Wardens of all States
5. Director, Bombay Natural History Society
6. Dr. Vibhu Prakash, Principal Scientist, Bombay Natural History Society, Pinjore, Haryana
7. Director, IVRI, Bareilly
8. Country Representative of IUCN-India, New Delhi

The Terms of Reference of the NVRC:

The following were the terms of reference of the NVRC :

i. Oversee the implementation of the Action Plan for vulture conservation in India.

ii. Oversee the implementation of all recommendations from the symposium on developinga Regional Response to the conservation of South Asia' Critically Endangered vultures species and the regional steering committee.

iii. Collaborate with State Governments and research organizations to identify and monitor new and emerging threats to vulture population in India, and develop strategies and bring these to the attention of appropriate policy and decision-making bodies.

iv. Identify opportunities to enhance regional coordination and cooperation, including the harmonization of relevant policies and legislation, the creation of trans-boundary VSZ, sharing of experiences and best practices.

v. Help and identify priority research, conservation, recovery and monitoring projects and assist in seeking financial and technical support for the implementation.

vi. Promote education, communication and public awareness raising activities highlighting the importance and urgency of vulture conservation and recovery efforts.

vii. Monitor population of vultures in the States and work out strategies for the establishment of self-sustaining population.

viii. Monitor the establishment and development of ex-situ conservation centres for vulture's conservation and recovery.

Adult White-backed vulture

CHAPTER III

The Urgent need for updating the Action Plan for Vulture Conservation in India

A Long-billed vulture nestling being reared in nursery aviary at VCBC Pinjore, Haryana

The implementation of the APVC 2006 provided useful guidelines for the Conservation of vultures in the country and helped in halting the further declines of the vulture populations by identifying the cause of mortality, achieving the ban on the vulture toxic veterinary drug, diclofenac, identifying a vulture safe veterinary non-steroidal anti-inflammatory drug, meloxicam, establishing successful Vulture Conservation Breeding Programme and establishing vulture safe zone programme for the conservation of the remnant populations of vultures in the wild.

There are however, still a number of challenges to the conservation of vulture populations in the country. The major food of vultures, cattle carcasses, still could contain toxic levels of NSAIDs as human formulations of diclofenac are still being used for treating cattle as they could be obtained across the counter, though it is a prescription drug.

There are other NSAIDs also which have been found toxic to Gyps vultures and are being used in treating cattle like the ketoprofen, aceclofenac and nimesulide. The aceclofenac is a pro-drug of diclofenac and gets converted into diclofenac within hours of administration. Nimesulide was found to be associated with gout in vultures. Some of the cattle carcasses contained high concentration of NSAIDs as they were overdosed during treatment by unqualified veterinarians before they died.

It is a fact that vultures continue to die of NSAIDs poisoning. The Vulture Conservation Breeding Programme has been successful as all the three resident Gyps species of vultures have bred in captivity and a good number of nestlings hatch every year but the reintroduction of the captive bred vultures would be successful only if the environment is safe for vultures in the released areas. So it is imperative that the toxic NSAIDs are removed from the main food of vultures i.e. the cattle carcasses.

The populations of two other species of vultures, the Red-headed Vulture and Egyptian Vulture have also crashed over the years, possibly due to NSAIDs poisoning. The population and conservation status of the remaining four species of vultures is not known much but their populations appear to be declining. Though there is evidence of toxicity of the veterinary NSAIDs only for Gyps species, the other species are very likely to show similar physiological intolerance and exposure risk to diclofenac and other toxic drugs through a common ancestry and foraging niche with Gyps vultures.

Vulture populations are precariously small and will remain vulnerable to adverse events until the numbers have increased substantially.

This vulnerable period will be lengthy because the low natural reproductive capacity and long duration of immaturity of vulture means that, even under the most favourable conditions, the shortest period in which a wild vulture population can double in size is about ten years.

The rate of the recent population decline was much more rapid than the fastest possible rate of increase, with the population of the species most strongly affected by diclofenac halving every year. Even when diclofenac has disappeared, conditions may not permit the maximum possible rate of recovery because of other problems caused by the vulture decline and effects of other NSAIDs.

Hence the acute need for a Revised Action Plan for the conservation of vultures, which would give guidelines for the continuation of the current actions and expand the scope of some objectives. ■

Adult White-backed vultures

Juvenile White-backed vulture

CHAPTER IV

Action Plan for Vulture Conservation in India: 2020-2025

A. INTRODUCTION

The conservation actions based on the Action Plan for Vulture Conservation 2006 (APVC-2006) did produce encouraging results but there is still a lot to be done as the environment is not yet safe for vultures. So, apart from continuing all the efforts mentioned in the APVC-2006. The following urgent actions need to be taken immediately for their conservation:

Flock of Himalayan griffons

B. PROPOSED OBJECTIVES

1. Prevention of poisoning of cattle carcasses, the principal food of vultures

2. Enhancement of Conservation Breeding Programme in the country

3. Regular monitoring of vultures across the country

4. Enhancing the vulture safe zone network by creating at least one vulture safe zone in each state and continuing to work on the existing efforts of vulture safe zone.

5. Determining and preventing other causes of mortality in vultures

In order to achieve the said objectives, the following actions need to be taken:

OBJECTIVE 1.
PREVENTION OF POISONING OF CATTLE CARCASSES, THE PRINCIPAL FOOD OF VULTURES

The poisoning of vulture food by NSAIDs continues to be a pressing problem for vulture conservation in the country. The non-implementation of certain laws relating to the distribution and use of veterinary NSAIDs continue to make cattle carcasses toxic to vultures.

There are a good number of veterinary NSAIDs of unknown toxicity to vultures and they could cause mortality. Two more drugs, ketoprofen and aceclofenac, have been found toxic but are still not banned for veterinary use.

ACTIONS

The following needs to be taken up to ensure that the vulture food is not contaminated by the use of NSAIDs on cattle:

A. ENSURING SALE OF VETERINARY NSAIDS ONLY ON PRESCRIPTION

The veterinary NSAIDs are in the Schedule-H of the Drug and Cosmetics Act 1940 and they could legally be obtained only on the prescription of a medical or veterinary practitioner, but in reality the drug could be purchased across the counter anywhere in the country. This encourages purchase of banned drugs for veterinary use or purchase in large volumes by unscrupulous and unqualified persons who then inject them into animals. In our country, a large number of unqualified persons treat animals.

This was the reason that despite the ban on the veterinary use of diclofenac, it continued to be used in treating livestock and cattle, and vultures continued to die.

It is recommended that the NSAIDs are put in Schedule-X of the Drug and Cosmetics Act 1940, which makes it mandatory for the chemist to sell the drugs only on prescription and retain one copy of prescription that has to be produced when the sales records are inspected.

B. ADMINISTRATION OF NORMAL VETERINARY DOSE TO CATTLE

It was observed during the analysis of cattle carcass liver samples, that the animals were routinely heavily overdosed sometimes as much as 35 times the normal veterinary dose (Taggart et al. 2009, Naidoo et al. 2010).

This happens when, during the course of the treatment, a drug supposed to be given once in 24 hours is administered after every couple of hours or so if the person treating thinks it is not giving relief. This high concentration of drugs could make the carcasses very toxic.

This largely happens because a large number of untrained individuals provide veterinary care in India. However, if only normal veterinary doze is administered, many of the carcasses will not have toxic levels of drugs.

So it is important for the Commissioner of Animal Husbandry to take appropriate action to ensure that the veterinary treatment is given only by qualified

Cinereous vulture and White-backed vultures

medical practitioners, which is also a requirement of the law.

C. SAFETY TESTING OF THE DRUGS ON WILD SCAVENGING BIRDS BEFORE THE NEW NSAID MOLECULE IS LAUNCHED IN THE MARKET

There are 14 veterinary NSAIDs in the market and only four (diclofenac, meloxicam, ketoprofen and aceclofenac) have been safety tested on vultures; others are of unknown toxicity.

The clinical trials for veterinary drug molecule before its introduction in the market are usually done on laboratory animals but not on any wild scavenging birds.

The toxicity of a drug is largely based on the metabolism of the animal that receives the drug and it could vary between families and genera. For example, the Turkey Vultures *Cathartes aura* and Pied *Crows Corvus* alba were unaffected by diclofenac even at very high doses (Rattner et al. 2008, Naidoo et al. 2011) and domestic chickens *Gallus gallus domesticus* were only susceptible at doses 50-100 times larger than estimated for the OWBV (Naidoo et al. 2007).

So, it is important that the clinical trials of the drugs are done on scavenging birds, especially vultures, as quite a few drugs end up in animal carcasses which are fed upon by these birds. The new molecule should be introduced in the veterinary market only if it is safe for vultures and other scavenging birds.

D. SCIENTIFIC MANAGEMENT OF CARCASS DUMPS

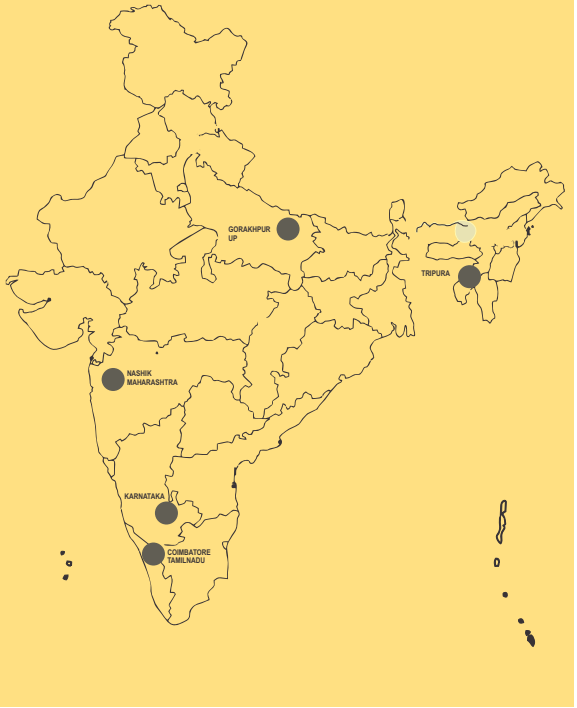
The carcass disposal system is very primitive in our country. A dead animal is either skinned and thrown out in the open or is disposed off at a dump. All dead animals, whether they died in a road accident or of any sickness, are dumped. A good number of scavengers get attracted to these dumps as there is regular and plentiful food supply. However, a good number of scavenging birds of different species could die if even one carcass is laced with poison. If the animal died because of synthetic pesticides, the birds feeding on it would die around the carcasses. However, if the carcasses have toxic NSAID residues, they would die within one week and not necessarily at the dump but far from it because NSAIDs poisoning does not kill immediately. This could impact a good number of birds and species.

Hence, there is a need to have a policy where only animals that have not received any kind of veterinary treatment prior to their mortality could be dumped at open carcass dumps and the rest should be incinerated.

This would go a long way in the conservation of vultures and many other species.

The Commissioner of Animal Husbandry, Ministry of Animal Husbandry, Dairying and Fisheries could be requested to make a policy to avoid open disposal of treated cattle carcasses, so that they are not available for feeding.

Proposed locations of new Vulture Centres in the country



E. MANAGEMENT OF WILD ANIMAL CARCASSES IN PROTECTED AND NON-PROTECTED AREAS

There is a very good population of large herbivores in the forested areas of the country, which is also evident by the increasing population of large cats. There is natural mortality as well as by predation of the large herbivore that provide excellent food resource to vultures. Wild herbivores are unlikely to be treated and the food will be safe for vultures. The MoEF&CC and State Forest Departments should ensure that the carcasses are not removed but are left out in open for vultures and other scavengers. This will make vultures less dependent on cattle carcasses, which are likely to be toxic as a consequence of being treated with toxic NSAIDs.

The carcasses of tiger, elephant and rhino, which are usually the targets of poachers, could be disposed of as per the current official practice.

F. ESTABLISHMENT OF CO-ORDINATED, WELL-ESTABLISHED AND EFFICIENT REGULATORY MECHANISM FOR BAN ON DRUGS FOUND TOXIC TO VULTURES

There are a number of NSAIDs in the market with unknown toxicity to vultures. If a drug is found to be toxic by a scientific study and it is published in high impact factor international journal, it should be automatically removed from the veterinary market once the paper is reviewed by the technical committee of DCGI. A mechanism should be developed to automatically ban a drug if it is found toxic to vultures or other scavenging birds.

Though toxic, NSAIDs aceclofenac and ketoprofen are still not banned in the country. The mechanism should be such that legal restrictions are imposed upon veterinary drugs known to cause harm to vultures.

This should be done in coordination with MoEF&CC, MoH&FW and Indian Veterinary Research Institute (IVRI) of Ministry of Agriculture, Government of India. The BNHS and international institutes like Royal Society for Protection of Birds (RSPB) could be requested to provide technical support.

OBJECTIVE 2. ENHANCEMENT OF CONSERVATION BREEDING PROGRAMME

The Conservation Breeding Programme was set up in 2004 as an insurance against extinction. Based on the experience with the ban on the veterinary use of diclofenac, it could be safely assumed that it will take more than 15 years to take a drug totally out of the veterinary use. So vultures are still exposed to the mortality factor that caused a crash in their populations. So Conservation Breeding Centres have to play a major role in the conservation of all the vulture species for many years to come.

The eight existing centres are spread over most of the geographical area of the country; however, there is only one centre each in the North east and South India. Though the primary objective of the Vulture Conservation Breeding Centres is breeding the Critically Endangered vultures, because of the facilities, infrastructure and capacities developed, the centres help in in-situ conservation efforts of vultures as well. This also keeps vulture conservation in focus of the decision makers.

The Conservation Breeding Centres also function as training facilities for biologists who work on vulture conservation. Thanks to the availability of expertise, the centres regularly hold training programmes in identification of vultures, sample collection techniques and survey methods.

The biologists working on in-situ conservation of vultures are based at the VCBCs and carry out vulture population and nest monitoring surveys, and monitor the prevalence of various NSAIDs by carrying out cattle carcass sampling and pharmacy surveys.

The centres also help in determining the cause of mortality in wild vultures by providing veterinary support in carrying out post mortems and analyzing samples. There are no other facilities in the country that are dedicated to the conservation of vultures. It would be useful to have them in all the major vulture range States of the country.

The Action Plan recommends setting up additional **5 Conservation Breeding Centres,** one each in the states of Uttar Pradesh, Maharashtra, Tamil Nadu, Karnataka and Tripura.

So it is important to have vulture centres in different parts of the country to enable vulture conservation work and to collect vulture and cattle samples for analysis from the region to find the cause of mortality and prevalence of drugs. There is a definite need to increase the number of centres.

ACTIONS

A. SET UP ADDITIONAL FIVE CONSERVATION BREEDING CENTRES

The Action Plan recommends setting up additional 5 Conservation Breeding Centres, one each in the states of Uttar Pradesh, Maharashtra, Tamil Nadu, Karnataka and Tripura.

The founder stock for these centres could be obtained from the existing Vulture Conservation Breeding Centres in the country with the permission of CZA. These centres could be utilized for holding, breeding and for reintroduction of vultures in the wild.

B. INITIATE CONSERVATION BREEDING PROGRAMME OF RED-HEADED VULTURE AND EGYPTIAN VULTURE

Cuthbert et al. (2006) found an 80.0% decline in Egyptian Vulture numbers and a 91.0% decline in the Red-headed Vulture using road transect surveys in and near protected areas in India between 1991 and 2003.

Based on these changes, RHV is listed as 'Critically Endangered' on the IUCN Red List and the EV as 'Endangered' (IUCN 2013). Galligan et al. (2014) reported a decline of 94% from 1992 to 2003 in India, with the rate of decline slowing and the population stabilizing since the mid-2000s. It is not currently known if EV and RHV are susceptible to diclofenac poisoning.

However, both species are likely to show the similar physiological intolerance and exposure risk to diclofenac and other toxic drugs through a common ancestry and foraging niche with Gyps vultures.

The removal of drugs from the food chain of the vultures is going to take a long time because of the procedures involved, hence initiating conservation breeding of both the species would be a good conservation strategy.

It would be possible to initiate conservation breeding of these species in the Vulture Conservation Breeding Centres established for the Gyps species of vultures, by adding a few more facilities to the existing infrastructure.

The Egyptian Vulture would however, not be bred in North-east Indian centres as it is beyond its distribution range.

C. SETTING UP VULTURE RESCUE CENTRES TO CATER TO INJURED AND SICK VULTURES

The vulture populations are very low and all individuals, in their own measure, contribute to the survival of the species. There are no rescue centres dedicated to vultures and raptors in the country. The vultures and raptors get injured due to kite string injuries, colliding with man-made structures or getting sick due to unintentional poisoning.

Many vultures can be saved by the Vulture Conservation Breeding Centres in the country with expert veterinary care but there is no place to house them for recuperating or rehabilitation. Some birds may have to be housed permanently. Most of these birds may not be able to fly after recovery but could breed in conservation breeding facilities and contribute to the gene pool. The unreleasable birds could be also utilized for safety testing of various drugs and for education purposes.

It would be advisable to set up Vulture Rescue Centres about 5-6 km from the Vulture Conservation Breeding Centres. The distance is good enough to keep the Vulture Conservation Breeding Facilities away from the spread of infections. But it should not be far to utilize the veterinary facilities of the centre, including the services of the veterinarian for advising on the veterinary care of the sick or injured birds.

Initially, four centres need to be set up. One close to Pinjore VCBC, one near Bhopal VCBC, one near Rani VCBC and one near Hyderabad. This could be done by the State Forest Departments with the approval of CZA and it should be run with the help of a veterinary college and national NGOs.

D. VULTURE REINTRODUCTION PROGRAMME OF CAPTIVE BRED VULTURES FROM BREEDING CENTRES

It has been decided to initiate the reintroduction programme of vultures from the conservation breeding centres, given the encouraging results of the captive breeding exercises involving the three Critically Endangered vulture species and the substantial fall in the prevalence of the veterinary drug diclofenac. The drivers for the initiation of the vulture reintroduction programme are:

1. **Production of about 60 nestlings every year in the vulture centres**

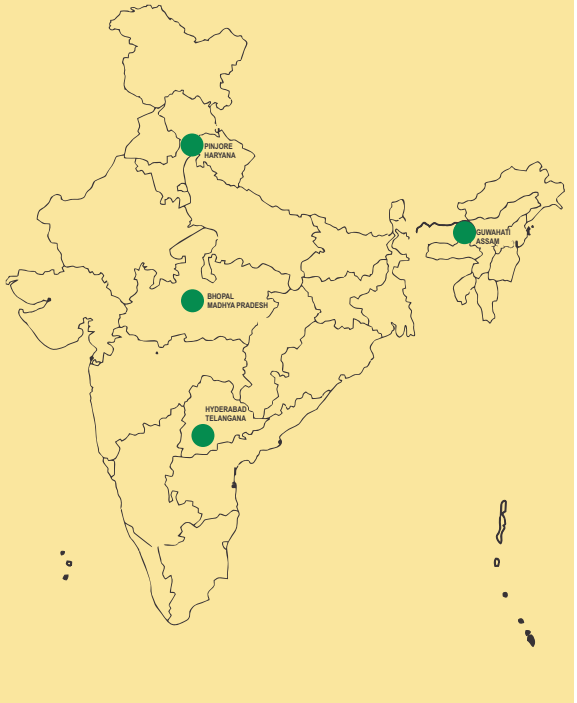
2. **Reduction of the prevalence of diclofenac in cattle carcasses from over 10.1% in 2006 to about 2% (excluding Rajasthan)**

3. **Restriction on the sale and manufacture of human formulations of diclofenac to 3 mL ampoules, which will further bring down the prevalence of diclofenac.**

A Soft Release will be attempted by housing 8 vultures, of over two years old, in pre-release aviary, which will be constructed in the areas where vultures will be released.

The pre-release aviary will be made of iron poles and netting, and will have a clear view of the habitat around. The free ranging vultures will be attracted outside the aviary to encourage interaction with

The locations of proposed Vulture Rescue Centres in the country



captive bred vultures. Once captive bred vultures have good interaction with free ranging vultures for three months or so, the netting will be lifted from one end, giving the opportunity to the captive bred vultures to go out and join the free ranging vultures.

It is expected that the free ranging vultures will act as guide birds and will take them to the food resources and teach them to avoid predators. Before the birds are released in the wild, it will be ensured that the habitat is safe for vultures in 100 km radius from the release aviary. The birds will be released after deploying Satellite Transmitters (PTTs) for monitoring.

OBJECTIVE 3. REGULAR MONITORING OF VULTURE POPULATIONS ACROSS THE COUNTRY

The monitoring of the populations of all the nine species of vultures should be carried out regularly to get an idea of the trend in populations and also of the effectiveness of the conservation efforts. It is expected that populations of large birds of prey remain fairly stable or increase slightly under normal circumstances.

ACTIONS

A. TRANSECT COUNTS

It is proposed that the transect counts carried out by BNHS should continue and should include transects in south India as well, at a definite period of time.

B. COORDINATED NATION-WIDE VULTURE COUNT

In addition to the transect counts, a total count should be carried out all over the country simultaneously, following the example of Gujarat. It will involve a good number of forest staff, NGOs and members of public and will help in generating awareness as well. The count should be coordinated by the MoEF&CC.

It should be done once every four years and ideally in the month of February when both resident and wintering species are present in good numbers. It would be good to identify a National coordinator and State coordinators, and work through the Indian Bird Conservation Network (IBCN) in the country.

C. NEST MONITORING

Nest of various species should be identified and a few prominent nests should be monitored regularly by

Adult Long-billled vulture (Photo: Saurabh Mathur)

Adult Long-billed vulture. Photo: Saurabh Mathur

research institutions. The nesting success should be determined, which would help in evaluating the conservation efforts of the States.

D. MONITORING THE POPULATION OF BEARDED VULTURE

The Bearded vultures are found largely in the Himalayan and Trans-Himalayan areas. So far, no monitoring of this species has been done in the country. Their populations will be estimated by laying road transects in these areas. The vulture population should be monitored in Jammu and Kashmir, Ladakh, Himachal Pradesh, Uttarakhand, West Bengal, Sikkim and Arunachal Pradesh. It should be done in each of the hill states and there should be a mechanism of reporting the sightings of BV. Information should also be collected on the resident populations of HV and the winter migrants like CV and EG.

OBJECTIVE 4.
ENHANCING THE VULTURE SAFE ZONE (VSZ) NETWORK BY CREATING AT LEAST ONE VSZ IN EACH STATE AND CONTINUING TO WORK ON THE EXISTING EFFORTS OF VSZ

The work on creating VSZ is going on at nine different locations in the country. These are in the States of Madhya Pradesh, Uttar Pradesh, Assam, Jharkhand, Gujarat, West Bengal, Haryana, Tamil Nadu and Kerala. At the moment, a special zone like VSZ has been created only for Gyps vultures, but it is a crucial necessity for many of the species.

ACTION

Most States in India have distribution of at least six species of vultures. It is proposed to have one VSZ in each of the States. While identifying the locations, it should be made sure that the population of at least two species of vultures exists in the area. It will be accomplished by ensuring low prevalence of toxic NSAIDs in an area of 100 km radius from the vulture colony by targeted advocacy and awareness programmes following the established protocol. This will help in the conservation of vultures across the country with participation of people and communities (For details see Chapter-II & Appendix VI).

OBJECTIVE 5.
OTHER CAUSES OF MORTALITY

A. UNINTENTIONAL POISONING

The vulture falls victim to unintentional or retaliatory poisoning when a cattle owner or farmer stuffs the carcass of his cattle, killed either by feral dogs or a wild

predator, with organo-chlorine or organo-phosphate.

The poisoning incidences are largely occasional and far in between and they do not appear to be responsible for the crash in vulture populations. However, the population of vultures is so low that even occasional unintentional poisoning of carcasses could cause local extinctions and should be prevented.

A major problem is the easy availability of very potent agricultural pesticides like Carbamates (Furadon), phorate, phosphamidon, malathion and monocrotophos. These pesticides are sometimes used in the country for retaliatory poisoning.

The sale and distribution of pesticides that are very potent and could cause mortality in large mammals and birds should be restricted.

These chemicals should be sold for specific purpose with the approval of Agriculture Extension Officers or insecticide inspectors. The stock possessed by retailers should be regularly checked. Strict action should be taken against the person who misuses pesticide to kill birds or animals.

Farmers and cattle owners should be made aware of the dangers of using the pesticides and that its misuse could be fatal to vultures.

B. COLLISIONS WITH POWER INFRASTRUCTURE

Very little scientific information is available about this threat in Asia and the Middle East. Kumar et al. (2012) monitored bird mortality for one year at a wind farm in Gujarat, confirming that collisions of birds with turbines occur, although no vultures were recorded in the study.

Though these studies are so far extremely limited, information from Africa and Europe shows that the threats of collision must be taken seriously in view of the increasing density of power grids.

c. Electrocution

Bird mortality by electrocution on power poles is a global problem that has become more prevalent in

Vultures roosting on a power pylon.

energy, resulting in infrastructure growth often in previously undeveloped areas. Electrocution associated with powerlines occurs when a bird comes into contact with two wires, one of which is live, or when it perches on a conductive pylon (for example, a metal structure) and comes into simultaneous contact with a live wire.

Large species such as vultures, eagles and storks are particularly vulnerable. Electrocution risk can be very significant at old, badly designed and insulated poles and poorly located power lines. Effective planning, design and mitigating measures can dramatically reduce the impact of energy infrastructure on avian populations (Birdlife International 2017).

Juvenile Long-billed vulture

C. TAXONOMIC SCOPE OF THE APVC 2020-2025

The APVC covers all the nine species of vultures recorded from India. Five are of genus Gyps, including the residents OWBV, LBV, SBV and wintering, HV and EG. Rest of the species are monotypic, including the resident RHV, EV and BV.

Though there is evidence of toxicity of the veterinary NSAIDs only for Gyps species but other species are very likely to show similar physiological intolerance and exposure risk to diclofenac and other toxic drugs through a common ancestry and foraging niche with Gyps vultures.

D. DURATION OF THE ACTION PLAN 2020-2025

The time period for the implementation of the Action Plan is from 2020 to 2025. The Action Plan will be extended for another five years after 2025 following a critical evaluation of the implementation of the key objectives or the action points.

E.THE MID-TERM REVIEW OF THE ACTION PLAN

A detailed mid-term review of the Action Plan will be carried out during the year 2022-2023 under the Chairmanship of IG (Wildlife) with a three-member expert committee appointed from the National Vulture Recovery Committee. The progress of the implementation will be reviewed every six months by the NVRC.

F. EXPECTED OUTCOME OF THE ACTION PLAN AFTER FIVE YEARS OF IMPLEMENTATION

The National Committee headed by Secretary (Wildlife), MoEF&CC, is expected to update the following points during the NVRC meeting in 2025.

1. All existing molecules of NSAIDs are safety tested, and restrictions are placed on the veterinary use of the ones found toxic to vultures.

2. The NSAIDs are put in the Schedule-X of the Drug and Cosmetic Act 1940 and are available on

prescription of veterinarians and one copy of the prescription is retained by the chemist.

3. Cattle and livestock are treated only by qualified veterinarians following the best practices, including administration of prescribed doses of drugs to animals.

4. A robust regulatory mechanism should exist by which all vulture toxic NSAIDs are automatically banned for veterinary use.

5. Disposal of domestic carcasses is scientifically managed and vultures are not exposed to treated carcasses.

6. The carcasses of wild ungulates are left out in the open in protected areas and reserved forests for scavengers.

7. The locations for the proposed vulture safe zones are identified in all the states and all the species of vultures are covered in at least two states. Vulture populations are monitored in all the proposed vulture safe zones and also the prevalence of various veterinary drugs is carried out by pharmacy surveys and cattle carcass sampling.

8. The additional Vulture Conservation Breeding Centres proposed in the Action Plan and the existing centers are fully functional and follow the standard protocols developed by Central Zoo Authority.

9. Vulture reintroduction programme is ongoing, and released vultures are monitored by satellite tracking. No drug-related mortality is reported.

10. The baseline information on the population trends is established for all the nine species of vultures in the country, both at the national level and at the State level. Coordinated nation-wide counts are carried out every four years.

11. Populations of none of the species are declining.

Juvenile Long-billed vulture

Flock of Gyps vultures. Photo: Batuk Bhil

CHAPTER V

Institutional framework and Implementation Strategy for Action Plan for Vulture Conservation 2020-2025

A. INTRODUCTION

The formulation of APVC 2020-2025 is important but a well-planned strategy to implement the Action Plan is of paramount importance. The onus of the conservation of any species of wild animal or plant is on the MoEFCC, of Government of India.

A pair of Long-billed vultures

So, the implementation of the APVC 2020-2025 also rests with MoEFCC. However for the conservation of vultures, there is very little that the MoEFCC can do on its own as the cause of crash in vulture populations is the veterinary use of NSAIDs. The licensing and the distribution of the drugs is the responsibility of the DCGI of the MoH&FW, dispensing and administration is the responsibility of the Animal Husbandry Commissioner of MoAHDF.

So, conservation of vultures is not possible without the active cooperation of MoH&FW and MoAHDF.

The Ministry of Power, Renewable Energy, Chemical and Fertilizer will also need to be involved to a lesser extent. So, the conservation of vultures is much more challenging than of any other wild species as it would require inter-ministry coordination.

B. THE PROPOSED PLAN OF IMPLEMENTING THE APVC 2020-2025

1. ROLE OF VARIOUS AGENCIES

i. AT CENTRAL GOVERNMENT LEVEL

The role of key implementing and coordinating agencies:

A. MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE (MOEFCC), GOVERNMENT OF INDIA

The MoEFCC is the custodian of Wildlife and Forests and implements the Indian Wildlife (Protection) Act 1972 as well as the Biological Diversity Act 2002. The MoEFCC has prepared the APVC 2020-2025 and would be responsible for its implementation. The MoEFCC will implement the Action Plan with the help and cooperation of various stakeholders in Vulture Conservation in the following manner:

THE NATIONAL VULTURE RECOVERY COMMITTEE

The MoEFCC has set up this committee and has involved all implementing, regulating and supporting ministries and institutions. This committee has been set up under the Chairmanship of Additional Director General of Forests (Wildlife), Government of India and has members from various stakeholder agencies.

This committee will have to play a crucial role for the full implementation of the APVC 2020-2025, as it would consist of all the implementing, regulating and supporting institutions.

The role of the NVRC will be clearly defined by the MoEFCC. The Inspector General of Forests (Wildlife)

is Member Secretary of the committee, who should ensure that the meetings of the committee happen regularly and action taken in each meeting are discussed.

SETTING UP OF NATIONAL COMMITTEE FOR VULTURE CONSERVATION

The MoEFCC will set up a National Committee for Vulture Conservation (NC), which will be chaired by the Secretary, MoEFCC and will have DCGI and Commissioner Animal Husbandry as members of the committee. The IG of Forests (Wildlife) will be the Member Secretary. The BNHS will be the non-official member to provide assistance to the Member Secretary.

This committee will also act as an Executive Committee of the NVRC. This committee will help in the day-to-day implementation of the APVC 2020-2025 and would also help to ensure the implementation of actions suggested by the NVRC.

FREQUENCY OF MEETING

The Committee will meet once in six months at the Indira Gandhi Paryavaran Bhavan, New Delhi.

B. THE CENTRAL ZOO AUTHORITY

The CZA will monitor the setting up of additional Vulture Conservation Breeding Centres and Vulture Rescue Centres. It will issue guidelines for setting up the centres and husbandry and care of vultures. The CZA will submit updates of setting up the vulture breeding and rescue during the NC meeting every six months.

C. MINISTRY OF HEALTH AND FAMILY WELFARE, GOVERNMENT OF INDIA

The Ministry has a very important role to play in vulture conservation, especially the DCGI. It would have the following responsibilities:

· Be part of NC for Vulture Conservation and also of NVRC.

· Help in getting a ban or restricting the use of vulture toxic drugs for veterinary use once the results are published in scientific journals.

· Encourage the testing of any new molecule of pain and anti-inflammatory drug on vultures and other scavenging birds before it is introduced in the market.

· Ensure that the veterinary NSAIDs are sold only on prescription as they fall in Schedule-H of Drug and Cosmetic Act 1940. It will try to put the veterinary NSAIDs in Schedule-X to ensure that the chemist retains a copy of prescription.

· Endeavour to get all the veterinary NSAID molecules available in the market safety tested on vultures.

· Ensure that no banned drug is used in treating livestock and cattle

D. MINISTRY OF ANIMAL HUSBANDRY, DAIRYING AND FISHERIES

They are important stake holders in vulture conservation in the country. The following will be the main role of this Ministry:

- Be a member of the NC and help in the implementation of important decisions.
- Ensure that the treatment of animals is done only by qualified veterinarians.
- Ensure that only recommended veterinary dose is given for veterinary treatment.
- Ensure only untreated animals are disposed at the carcass dumps. Treated animals should be incinerated.

II. AT THE STATE LEVEL

A. THE ROLE OF STATE FOREST DEPARTMENTS

All the PCCFs (Wildlife) and CWLWs will be responsible for implementing the APVC 2020-2025. The following will be the responsibility of the State Forest Departments:

SETTING UP STATE COMMITTEES

The MoEFCC will direct the State Forest Ministries to set up State Committees for vulture conservation to implement the actions suggested and guidelines issued by the NC. The State Committee will be formed by the Forest Secretaries of all the State governments with the PCCF & CWLW as the Chairman and Director General/Director, Animal Husbandry, Drug Controller as the members. The BNHS will be a non-official member and CCF (Wildlife) HQ will be Member Secretary.

The committee will ensure the implementation of APVC 2020-2025 at the State level. It will be the responsible agency to implement the NC's decisions.

SCHEDULE OF MEETING

The meeting should be held every month

ROLE AND RESPONSIBILITY OF THE STATE COMMITTEES

· Implementing all the advice and directions of the NC and NVRC, and setting up and monitoring at least one vulture safe zone in each State

· Facilitating the setting up of Vulture Conservation Breeding Centre in the identified States according to the CZA guidelines

· Appointing a State coordinator for the Nation-wide Vulture Census, identifying locations of vultures, developing teams for carrying out census and developing capacity

· Collecting cattle carcass liver samples with the scientific institutions or NGOs engaged in vulture conservation once in four years

· Making arrangements to send the rescued and dead vultures to the rescue centres; in case of the rescued vultures, facilitating their treatment at the centres and in case of mortality or dead vultures that are sent to the centres, facilitating post-mortem to find out the cause of mortality.

· Prepare an annual report on vulture conservation in the State.

B. ROLE OF DRUG CONTROLLERS OF STATES OF FOOD AND DRUG ADMINISTRATION

· Be a member of the State Committee (SC) for Vulture Conservation of the State.

· Help in getting a ban or restriction on the use of vulture toxic drugs for veterinary use, once the results are published in scientific journals.

· Ensure that the veterinary NSAIDs are sold only on prescription as they fall in Schedule-H of Drug and Cosmetic Act 1940.

· Ensure that no banned drug is used in treating livestock and cattle.

C. ROLE OF DIRECTOR GENERAL OF ANIMAL HUSBANDRY OF STATES

· They are important stakeholders in vulture conservation in every State. Their role entails:

· As members of SC, help in the implementation of important decisions.

· Ensure that the treatment of animals is done only by qualified veterinarians.

· Ensure that only recommended veterinary dose is given for veterinary treatment.

D. ROLE OF MUNICIPAL COMMISSIONERS FOR VARIOUS STATES

They are important stakeholders in vulture conservation in every State. Their role entails:

- They should be members of State Committees and help in implementation of important decisions.
- They should ensure that the carcasses are disposed off in scientific manner
- They should ensure at the time of awarding the tender for bone and hide, that the contractor does not allow dumping of bodies of animals from veterinary colleges, hospitals and the ones which have received medical treatment at the carcass dumps. Only animals which died of accidents and at cow shelters should be disposed off at carcass dumps.

Juvenile White-backed vulture

CHAPTER VI

International, Regional Action Plans Relevant to Implementation of Action Plan for Vulture Conservation in the Country

There are already available Actions Plans at the international, national and regional levels that bear relevance to the conservation of vultures of South Asia. It could be ensured that India's APVC has strong linkages to these plans:

A. INTERNATIONAL ACTION PLAN OF RELEVANCE TO VULTURE CONSERVATION IN INDIA

1. The Multi-Species Action Plan to Conserve African-Eurasian Vultures (Vulture MsAP):

The Vulture MsAP was developed by CMS Raptors MoU and was adopted by CMS Parties at COP12, held in Manila, Philippines from October 23 to 28, 2017. The action plan covers all the nine species of vultures recorded from India.

The mandate for the development of the International Multi-species Action Plan to conserve African-Eurasian Vulture was established at the 11th Conference of the Parties to the Convention on the Conservation of Migratory Species of Wild Animals (CMS) in November 2014. CMS resolution 11.14 on the Programme of Work on Migratory Birds and Flyways was adopted. Action 9 of the Resolution, under the Species-Specific Conservation Actions section, seeks to promote the development, adoption and implementation of species action plans for priority species in line with CMS priorities for concerted and cooperative action. Action 9 refers to all African-Eurasian Vultures (except Palm-nut Vulture Gypohierax angolensis) via the CMS Memorandum of Understanding on the Conservation of Migratory Birds of Prey (Raptors MoU). Resolution 11.14 also recognises both the IUCN SSC Vulture Specialist Group and BirdLife International as key collaborating partners.

At the Second Meeting of signatories to the Raptors MOU held in Trondheim, Norway, in October 2015, signatories formally recognized all old world vultures (except Palm-nut Vulture) as migratory species by listing them in Annex-1 and Table 1 of Annex-3 of Raptor MOU (Coordinating Unit of the Raptors MOU 2015).

In addition, the Technical Advisory Group (TAG) was tasked to support the Coordinating Unit in facilitating the development of the Vulture MsAP. In February 2016, the coordinating unit established an Interim Steering Group, including representatives from IUCN SSC Vulture Specialist Group, BirdLife International and other specialists, to guide the planning and preparations for the development of the Vulture MsAP.

The Mission of the MsAP was to bring together representatives of the Range States, partners and interested parties, to develop a coordinated Vulture MsAP to be submitted to the 12th meeting of the Conference of the Parties (COP12) to the CMS held in October 2017.

AIMS AND OBJECTIVES

The overall aim is to develop a comprehensive strategic Action Plan covering the whole geographic ranges (128 countries) of 15 species of old world vultures to promote concerted and collaborative international conservation actions.

The objectives of the Vulture MsAP are to rapidly halt current population declines in all species covered by the Vulture MsAP; reverse recent population trends to

bring the conservation status of each species back to a favourable level and provide conservation management guidelines applicable to all Range States covered by the Vulture MsAP.

Reference: Botha, A. J., Andevski, J., Bowden, C. G. R., Gudka, M., Safford, R. J., Tavares, J. and Williams, N. P. (2017). Multi-species Action Plan to Conserve African-Eurasian Vultures. CMS Raptors MOU Technical Publication No. 5. CMS Technical Series No. xx. Coordinating Unit of the CMS Raptors MOU, Abu Dhabi, United Arab Emirates.

B. REGIONAL ACTION PLAN OF RELEVANCE TO VULTURE CONSERVATION IN INDIA

SAVE Blueprint for the Recovery of South Asia's Critically Endangered Gyps Vultures:

The 'Saving Asia's Vultures from Extinction' (SAVE) is a consortium, of about 24 organisations with known expertise in vulture conservation, which was established formally in February 2011.

These organizations have the common understanding to agree, prioritize and help to implement the actions required to conserve Asia's Critically Endangered vultures, based on sound scientific grounds.

The SAVE coordinates the actions to prevent the extinction of Gyps vultures in South Asia.

The SAVE has developed a Blueprint for the Recovery of South Asia's Critically endangered Gyps Vultures till 2025. This was developed in February 2014. This document has been compiled with inputs from experts primarily from the five range countries concerned – Bangladesh, Cambodia, India, Nepal, and Pakistan.

Although the SAVE consortium has coordinated its compilation, it has already been adopted by the Government and IUCN led Regional Steering Committee for the conservation of vultures of South Asia, and is seen as a valuable update to the earlier 2004 Regional Action Plan and the country Action Plans from 2006 (India), 2005 (Cambodia) and 2009 (Nepal).

It is also intended to provide a framework that facilitates the process of producing and updating Country Action Plans for vultures. SAVE meetings will revisit this Blueprint on an annual basis and through SAVE reporting; it will track the progress of each objective and activity, flagging up any that are not being met and updating the document as required.

C. NATIONAL ACTION PLAN OF RELEVANCE TO VULTURE CONSERVATION IN INDIA

Vulture Conservation Action Plan for Nepal 2015-19

The Nepal Vulture Conservation Action Plan was released on 30 July 2015. The Action Plan was jointly prepared by Department of National Park and Wildlife Conservation and Bird Conservation Nepal. The 5-year Action Plan emphasizes the removal of vulture toxic drug diclofenac from the environment. The plan highlights the initiatives taken till date to ban the use of diclofenac in coordination with different national and regional level partners and the Vulture Conservation Breeding efforts in Nepal.

The major goal of the Action Plan is to prevent the extinction of vultures in Nepal. The objective is to restore viable wild populations of all species of vultures through the provision of safe food, maintenance of suitable habitat and captive-breeding and re-introduction.

Eight species of vultures are recorded from Nepal and all are recorded from India also. Diclofenac is found to be the main cause of the crash in vulture populations.

Reference: DNPWC 2015: Vulture Conservation Action Plan for Nepal(2015—2019). Department of National Parks and Wildlife Conservation, Ministry of Forests and Soil Conservation, Government of Nepal, Kathmandu.

D. THE REGIONAL DECLARATION ON THE CONSERVATION OF SOUTH ASIA'S CRITICALLY ENDANGERED VULTURE SPECIES

The government representatives of four South Asian countries who attended the "Symposium on

Developing a Regional Response to the Conservation of South Asia's Critically Endangered Vultures Species" held in Delhi from May 3 to 4, 2012, adopted a regional declaration on vulture conservation.

They decided to work together to save the Critically Endangered species of vultures of the region. The countries pledged to strengthen regional cooperation to promote vulture breeding and reintroduction programme.

Strengthening of monitoring and research in vulture population and stringent measures to remove toxic vulture-killing drugs from the environment are also included in the declaration document.

An important recommendation of the Regional Declaration of the four South Asia countries was constitution of the Regional Steering Committee (RSC). The RSC was constituted on September 24, 2012 with India as the first Chair on two-year rotational basis.

The other countries of the national committee are Bangladesh, Nepal, and Pakistan, with representative each from a leading NGO in each country, from IUCN (Co-chair), INGO (to nominated by Birdlife), Central Zoo Authority of India, Wildlife Institute of India,UN agency facilitating the development of the Global Environmental Facility proposals and the Chair of the SSC Vulture Specialist Group.

(See Appendix VII—for details of the Delhi Declaration 2012)

White-backed vultures at a carcass dump

A kettle of vultures

CHAPTER VII

I. Action Timeline for Advocacy and Implementation at National Level

AD: Preventing the Poisoning of Cattle Carcasses, the Principal Food of Vultures

Timeline code	AD-1
Action	Ensuring the sale of veterinary NSAIDS only on prescription.
Responsible Agencies/stakeholders	Ministry of Environment, Forest and Climate Change(MoEFCC), Ministry of Health and Family Welfare, Ministry of Animal Husbandry, Dairy and Fisheries, Indian Veterinary Research Institute, State Forest Departments, Drug Controllers, Director General of Animal Husbandry of States, Municipal Commissioners, Bombay Natural History Society
Budget(in crore Rs.)	2.50 (additional funding from Departments' budget)

2020-21	2021-22	2022-23	2023-24	2024-25
Establish National committee (NC). Chairman: Secretary MoEF&CC Members: DCGI, DGFT, MoC&F, Commissioner, Animal Husbandry. Establish State Committee (SC) (All States) Chairman: PCCF(Wildlife) Members: State Drug Controller (SD) Director General, Animal Husbandry (DGAH), BNHS. DCGI : Issue guidelines/Gazette notification to strictly enforce sale of NSAIDs only on prescription. Consider putting NSAIDs in Schedule-x of the Drugs and Cosmetics Act, 1940. Dept of AH: all vets to provide prescriptions for drugs	SC issues guidelines to all its field officers, Chemists and Druggists associations, and all chemists, wholesellers and retailers	Drug inspectors hold meetings with Chemists and Druggists and make them aware of the directives and guidelines to sell NSAIDs on prescription	SC reviews implementation of the order during its six monthly meetings and report to NC.	National NGO carries out survey for the implementation of sale of Veterinary NSAIDS on prescription

I. Action Timeline for Advocacy and Implementation at National Level

AD: Preventing the Poisoning of the Cattle Carcasses, the Principal Food of Vultures

Timeline code	AD-2
Action	Ensuring treatment of livestock by qualified veterinarians to avoid overdosing of cattle during veterinary treatment
Responsible Agencies/stakeholders	MoEF&CC, Ministry of Health and Family Welfare, Ministry of Animal Husbandry, Dairy and Fisheries, Indian Veterinary Research Institute, State Forest Departments, Director General of Animal Husbandry of States, Bombay Natural History Society
Budget(in crore Rs.)	02:50

2020-21	2021-22	2022-23	2023-24	2024-25
Establish National committee (NC). Chairman: Secretary MoEF&CC Members: DCGI and Commissioner, Animal Husbandry Issue guidelines/Gazette notification to ensure that the treatment of livestock is done only under the supervision of a qualified Veterinarian		Implementation of the central committee decision to ensure veterinary treatment only under the supervision of qualified veterinarian.	The Dy. Directors and Assistant Directors of Department of Animal Husbandry hold meetings with the veterinary officers at panchayat and tehsil levels to ensure that livestock are treated by veterinary professionals only. SC Reviews implementation of the order during its monthly meetings and reports progress to	Carry out undercover survey by a National NGO for the implementation of NC directive for treatment of livestock by only qualified Veterinarians.
Establish State Committee (SC) (All States) Chairman: PCCF(Wildlife) Members: State Drug Controller (SD) Director General , Animal Husbandry (DGAH) and BNHS,				

I. Action Timeline for Advocacy and Implementation at National Level

AD: Preventing the Poisoning of the Cattle Carcasses, the Principal Food of Vultures

Timeline code	AD-3
Action	Safety testing of the drugs on vultures and scavenging birds before a new molecule of veterinary NSAID is launched in the market
Responsible Agencies/stakeholders	MoEF&CC, Ministry of Health and Family Welfare, Ministry of Animal Husbandry, Dairy and Fisheries, Indian Veterinary Research Institute, Bombay Natural History Society
Budget(in crore Rs.)	5.00 to IVRI for development of facilities and analysis of tissue samples

2020-21	2021-22	2022-23	2023-24	2024-25
Establish National committee (NC). Chairman:Secretary MoEF&CC Members: DCGI, Commissioner, Animal Husbandry NC issues instruction to Drug Approving Committee to ensure; 1. New NSAIDs Molecules are Safety Tested on vultures (Resident Gyps and Egyptian) and some other scavenging birds 2. Mointors the incorporation of Safety Testing in the Drug Testing Policy. 3. Setting up Drug Safety Testing Facility at IVRI and making it a routine to Safety Test new NSAID molecule on vultures and other scavenging birds. 4. Amending the D&C Act to include safety testing of select NSAID molecules on select species of wild birds.	NC issues instructions to the Drug Approving Committee to ensure that new NSAIDs are safety tested on Vultures (Gyps and Egyptian) and some other scavenging birds and monitors the incorporation of safety testing in the drug testing policy.	Need for amendment in D&C Act for including safety testing of select NSAIDs molecules on select wild species Setting up of Drug and Safety testing facilities on vultures and scavenging birds at IVRI and make it part of their routine safety testing of drugs on laboratory animals.		

I. Action Timeline for Advocacy and Implementation at National Level

AD: Preventing the Poisoning of the Cattle Carcasses, the Principal Food of Vultures

Timeline code	AD-4
Action	Scientific Management of Carcass Dumps
Responsible Agencies/stakeholders	MoEF&CC, Ministry of Panchayat Raj, Ministry of Health and Family Welfare, Ministry of Animal Husbandry, Dairy and Fisheries, Indian Veterinary Research Institute, State Forest Departments, Director General of Animal Husbandry of States, Municipal Commissioners
Budget(in crore Rs.)	10.00

2020-21	2021-22	2022-23	2023-24	2024-25
Establish National committee (NC). Chairman: Secretary MoEF&CC Members: DCGI, Commissioner, Animal Husbandry. Establish State Committee (SC) (All States) Chairman: PCCF(Wildlife) Members: State Drug Controller (SD) Director General , Animal Husbandry (DGAH) and BNHS, District Collector.	NC discusses and prepares a plan for management by 2021 of carcass dumps, circulates to States Committees. Gets this plan endorsed by 2022, Only animals killed in road accidents or died a natural death should be sent to carcass dumps. Rest should be incinerated.	SC should formulate the modalities of ensuring that only those animals that died without getting any treatment should be disposed of at carcass dumps and the rest should be sent to abattoirs.	SC should prepare guidelines for contractors, including a simple proforma for history of the carcass. The onus on the proper disposal of the carcass should rest with the contractor and the authority which awards the contract.	Assessment of implementation by impartial agency i.e a national or state NGO

I. Action Timeline for Advocacy and Implementation at National Level

AD: Preventing the Poisoning of the Cattle Carcasses, the Principal Food of Vultures

Timeline code	AD-5
Action	Achieve the ban on the veterinary use of ketoprofen and aceclofenac
Responsible Agencies/stakeholders	MoEF&CC, Ministry of Health and Family Welfare, Ministry of Animal Husbandry, Dairy and Fisheries, Indian Veterinary Research Institute
Budget(in crore Rs.)	01.00 for meeting at grassroot levels

2020-21	2021-22	2022-23	2023-24	2024-25
Establish National committee (NC). Chairman: Secretary MoEF&CC Members: DCGI, Commissioner, Animal Husbandry Establish State Committee (SC) (All States) Chairman: PCCF(Wildlife) Members: State Drug Controller (SD) Director General , Animal Husbandry (DGAH) and BNHS, District Collector MoEF&CC should seek ban on these drugs as they were found toxic to vultures. Provide scientific literature to DCGI. Seek ban – follow-up on the process already initiated through State Government of Haryana, Uttar Pradesh	NC advises the SC State Drug Controller/Animal Husbandry Director to stop Govt. supplies to vets and prohibits use by Govt vets. At least all VSZ initiatives to do this. DCGI should ban the drugs after examining the literature		MoEF&CC, BNHS and SAVE Provide technical assistance and advice on the operation of the ban, using information from monitoring.	

I. Action Timeline for Advocacy and Implementation at National Level

AD: Preventing the Poisoning of the Cattle Carcasses, the Principal Food of Vultures

Timeline code	AD-6
Action	To identify, by a robust safety testing and approval process, NSAIDs that are safe for vultures. Currently meloxicam is the only such drug.
Responsible Agencies/stakeholders	MoEF&CC, Ministry of Health and Family Welfare, Ministry of Animal Husbandry, Dairy and Fisheries, Indian Veterinary Research Institute, IITs and other institutions like Indian Toxicological Research Institute
Budget(in crore Rs.)	5.00 for safety testing of drugs for IVRI, IITs

2020-21	2021-22	2022-23	2023-24	2024-25
Establish National committee (NC). Chairman: Secretary MoEF&CC Members: DCGI, Commissioner, Animal Husbandry	The IVRI should safety test the four identified NSAIDs on Himalayan Griffon, a surrogate of the resident Gyps vultures, for unknown toxicity i.e. nimesulide, ibuprofen, analgin and paracetamol. *(Project funded by MoEF&CC 2016-18)*	Encourage safety testing of all the molecules of unknown toxicity of veterinary NSAIDs by IVRI. Take help of Indian Institutes of Technology for the detection and estimation of various NSAIDs in tissue extracts in acetonitrile in the labs (also provide them funds for Annual Maintainence Contract)		

2. Timeline Actions for the Conservation Breeding Programme

Timeline code	VCBP-1
Action	Conservation breeding of OWBV, LBV and SBV at VCBC Pinjore
Responsible Agencies/stakeholders	MoEF&CC, CZA, Haryana Forest and Wildlife Department, MP Forest Department, Assam Forest Department, Bombay Natural History Society
Budget(in crore Rs.)	22.50

2020-21	2021-22	2022-23	2023-24	2024-25
Maintain the captive population in good health. Produce as many fledglings as possible of all three species, using artificial intervention as appropriate.				
Shift 8 OWBV into pre-release aviary (2-4 yrs old) and soft release them in 2020 with PTT and wing tags, provided habitat is proved safe for release by monitoring results. (MoEF&CC to develop guidelines for monitoring)	Shift 20 OWBV into pre-release aviary by June 2022. Release them in wild if no drug related mortality occurred during the first release. Release with PTTs and wing tags.	Shift 20 LBV into a pre-release aviary at Bundelkhand, M.P (2-4 years old) by June 2022. Release them before March 2023 if the monitoring results showed low prevalence of vulture toxic NSAIDs. Release with PTTs and wing tags.	Shift 20 LBV into a pre-release aviary at Bundelkhand, M.P. (2-4 years old) by June 2023. Release them before March 2024 if the monitoring results showed low prevalence of vulture toxic NSAIDs. Release with PTTs and wing tags	Shift 20 OWBV into pre-release aviary (2-4 yrs.) and soft release them before March 2024 with PTT and wing tags. Shift 10 SBV to pre-release aviary in Assam near Rani (2-4 years old) by June 2024. All birds should be with PTTs and wing tags. Release before March 2025 if monitoring results show low prevalence of toxic NSAIDs

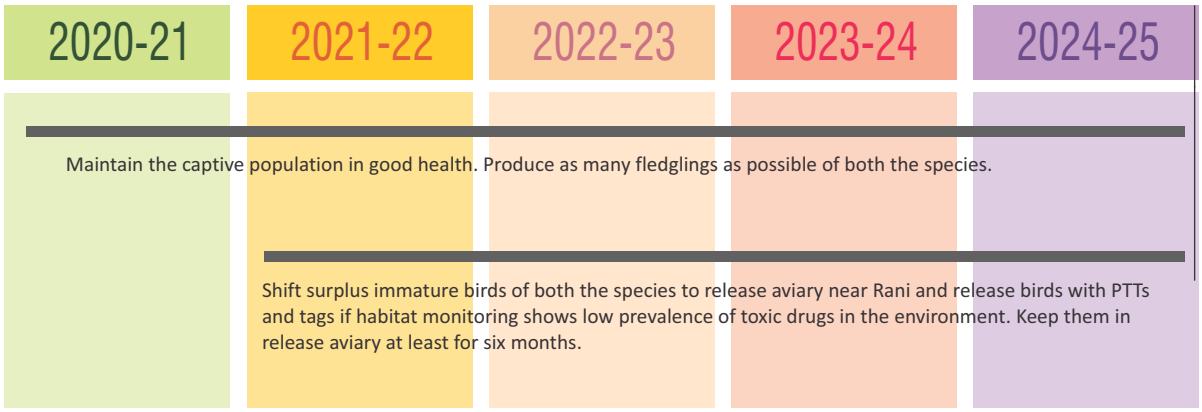
2. Timeline Actions for the Conservation Breeding Programme

Timeline code	VCBP-2
Action	Conservation breeding of OWBV, LBV and SBV at VCBC, Rajabhatkhawa
Responsible Agencies/stakeholders	MoEF&CC, CZA, West Bengal Forest and Wildlife Department, MP Forest Department, Bombay Natural History Society
Budget(in crore Rs.)	17.50

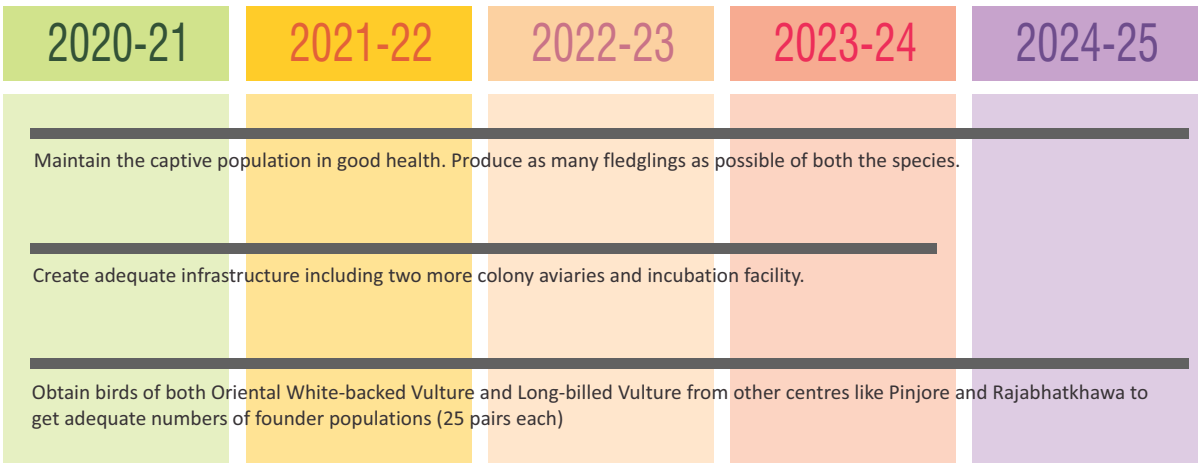
2020-21	2021-22	2022-23	2023-24	2024-25
Maintain the captive population in good health. Produce as many fledglings as possible of all three species, using artificial intervention as appropriate.				
Shift 5 Himalayan Vultures into pre-release aviary (2-4 yrs old) and soft release them before September 2020 two with PTT and wing tags and three with wing tags.	Shift 10 OWBV into pre-release aviary by October 2020. Release them in wild if no drug related mortality occurred during the first release by March 2021. Release with PTTs and wing tags. **Shift surplus Long-billed Vultures to new centres**	Shift 10 LBV into a pre-release aviary at Bundelkhand, M.P (2-4 years old) by June 2022. Release them before March 2023 if the monitoring results showed low prevalence of vulture toxic NSAIDs. Release with PTTs and wing tags.	Shift 10 LBV into a pre-release aviary at Bundelkhand, M.P. (2-4 years old) by June 2024. Release them before March 2025 if the monitoring results showed low prevalence of vulture toxic NSAIDs. Release with PTTs and wing tags.	Shift 10 OWBV and 10 SBV into pre-release aviary (2-4 yrs old) and soft release them before March 2025 with PTT and wing tags. All birds should be with PTTs and wing tags. Release before March 2025 if monitoring results show low prevalence of toxic NSAIDs.

2. Timeline Actions for the Conservation Breeding Programme

Timeline code	VCBP-3
Action	Conservation breeding of OWBV, and SBV at VCBC, Rani, Assam
Responsible Agencies/stakeholders	MoEF&CC, CZA, Assam Forests and Wildlife Department, Bombay Natural History Society
Budget(in crore Rs.)	10.00

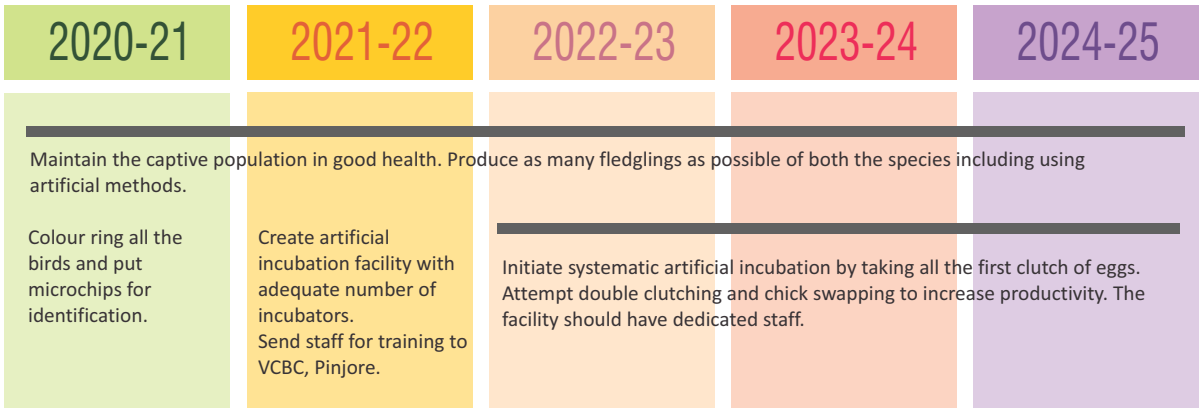


Timeline code	VCBP-4
Action	Conservation breeding of OWBV, and LBV at VCBC, Bhopal, Madhya Pradesh
Responsible Agencies/stakeholders	MoEF&CC, CZA, M.P. Forests and Wildlife Department, Bombay Natural History Society
Budget(in crore Rs.)	7.50

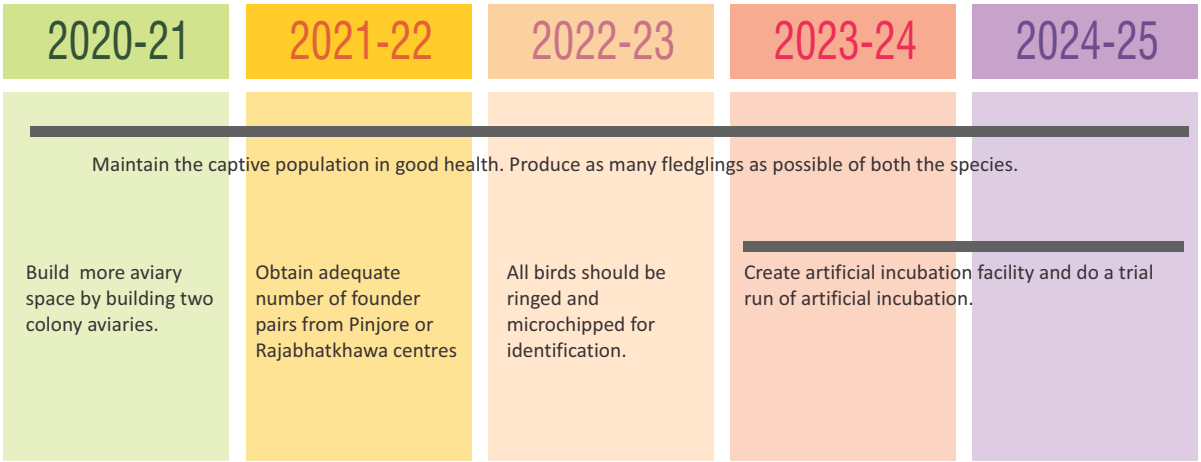


2. *Timeline Actions for the Conservation Breeding Programme*

Timeline code	VCBP-5
Action	Conservation breeding of OWBV and LBV at VCBC, Junagarh, Gujarat
Responsible Agencies/stakeholders	MoEF&CC, CZA, Gujarat Forest and Wildlife Department, Bombay Natural History Society
Budget(in crore Rs.)	10.00



Timeline code	VCBP-6
Action	Conservation breeding of OWBV and LBV at VCBC, Nandankanan, Odisha
Responsible Agencies/stakeholders	MoEF&CC, CZA, Odisha Forest and Wildlife Department, Bombay Natural History Society
Budget(in crore Rs.)	10.00



2. *Timeline Actions for the Conservation Breeding Programme*

Timeline code	VCBP-7
Action	Conservation breeding of OWBV, and LBV at VCBC, Muta Zoo, Jharkhand.
Responsible Agencies/stakeholders	MoEF&CC, CZA, Jharkhand Forest and Wildlife Department, Bombay Natural History Society
Budget(in crore Rs.)	10.00

2020-21	2021-22	2022-23	2023-24	2024-25
Enter into MoU with BNHS. Obtain 15 pairs of Oriental White-backed Vulture from Pinjore. Put leg ring, Micro-chips in all the birds for unique identification	Construct two more colony aviaries.	Obtain 20 OWBV from other vulture centres and house in a colony aviary.	Obtain 30 Long-billed vulture from other vulture centres.	Maintain the captive population in good health. Produce as many fledglings as possible of both the species.

Timeline code	VCBP-8
Action	Conservation breeding of OWBV, Nehru Zoological Park, Hyderabad.
Responsible agencies/stakeholders	MoEF&CC, CZA, Telangana Forest and Wildlife Department, Bombay Natural History Society
Budget(in crore Rs.)	15.00

2020-21	2021-22	2022-23	2023-24	2024-25
Identify a location 5 km away from the zoo for a satellite facility. Initiate construction of VCBC on 5 acres of land.	Construct two colony aviaries, two hospital aviaries, two holding aviaries and other infrastructure as per the guidance of CZA manual on Vulture Conservation	Obtain 30 pairs of OWBV from other vulture centres and house them in two colony aviaries, 15 pairs in each.	Obtain 30 LBV from other centres.	Maintain the captive population in good health.

2. Timeline Actions for the Conservation Breeding Programme

Timeline code	VCBP-9
Action	Prepare MOUS for Establishment of Conservation Breeding Centres for OWBV, LBV, SBV at Gorakhpur in Uttar Pradesh, Tripura, Ramnagara, Karnataka, Coimbatore, Tamil Nadu, Nashik, Maharashtra
Responsible Agencies/stakeholders	MoEF&CC, CZA, Uttar Pradesh, Tripura, Tamil Nadu, Karnataka, Maharashtra, Forest and Wildlife Departments, Bombay Natural History Society
Budget(in crore Rs.)	35.00

2020-21	2021-22	2022-23	2023-24	2024-25
Identify a location 5 km away from any zoo or poultry farm and construct a vulture conservation breeding centre on an area of 5 acres for breeding two species of vultures following the CZA manual of Vulture Conservation Breeding Programme. OWBV and SBV for Tripura and U.P, OWBV for Tamil Nadu, OWBV and LBV for Karnataka and Maharashtra		Obtain founder stock birds OWBV and SBV for Tripura and U.P., OWBV and LBV for Ramnagara and Nashik, OWBV for Coimbatore from vulture centres and house them in two colony aviaries, 15 pairs in each.		Maintain the captive population in good health.

Timeline code	VCBP-10
Action	Establishment of Conservation Breeding Centre for Red-headed Vulture
Responsible Agencies/stakeholders	MoEF&CC, CZA, Forest Departments of Haryana, Madhya Pradesh, Uttar Pradesh, Karnataka, Tamil Nadu, Maharashtra, Jharkhand, and Odisha, Bombay Natural History Society
Budget(in crore Rs.)	5.00

2020-21	2021-22	2022-23	2023-24	2024-25
The breeding programme for Red-headed Vulture will be established at all the existing and proposed Vulture Conservation Breeding Centres. 10 pairs will be kept in each of the centres. 10 Breeding aviaries of dimension 20x30x20' will be constructed and each aviary will house a pair of the Red-headed Vultures. All other facilities of the Vulture centres will be utilised for the Red-headed Vulture including artificial incubation.		10 founder pairs will be caught for all the centres where facilities have been developed for the Conservation Breeding of Red-headed Vulture. The husbandry and care will be followed as described in the Working Manual of Vulture Conservation Breeding Programme developed by CZA.		

2. Timeline Actions for the Conservation Breeding Programme

Timeline code	VCBP-11
Action	Establishment of Conservation Breeding Centre for Egyptian Vulture *Neophron percnopterus gingianus*
Responsible Agencies/stakeholders	MoEF&CC, CZA, Forest Departments of Haryana, Madhya Pradesh, Uttar Pradesh, Karnataka, Tamil Nadu, Maharashtra, Jharkhand, and Odisha, Bombay Natural History Society
Budget(in crore Rs.)	5.00

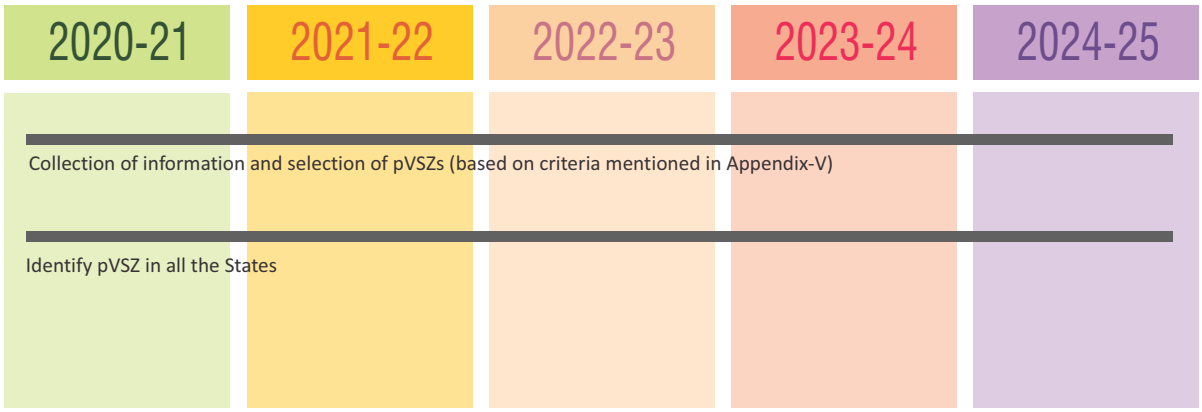
2020-21	2021-22	2022-23	2023-24	2024-25
10 pairs will be kept in each of the Vulture Conservation Breeding Centres. In each of the centres, 10 Breeding aviaries of dimension 20x20x20' will be constructed and each aviary will house a pair of the vultures. All other facilities of the centres will be utilised for the Egyptian Vulture including artificial incubation.		10 founder pairs will be caught for all the centres where facilities have been developed for the Conservation Breeding of Egyptian Vulture. The husbandry and care will be followed as described in the Working Manual of Vulture Conservation Breeding Programme developed by CZA.		

Timeline code	VCBP-12
Action	Establishment of Vulture rescue and rehabilitation centres
Responsible Agencies/stakeholders	MoEF&CC, CZA, Forest Departments of Haryana, Madhya Pradesh, Assam and Hyderabad, Bombay Natural History Society
Budget(in crore Rs.)	10.00

2020-21	2021-22	2022-23	2023-24	2024-25
The CZA permission will be sought and Forest Departments will be requested for 1 acre of Land near VCBC, Pinjore, VCBC, Bhopal, VCBC, Rajabhatkhawa and VCBC, Hyderabad.		The hospital aviaries, holding aviaries and colony aviaries, will be constructed based on the working manual of Vulture Conservation Breeding Programme. A clinical room, surgery room equipped with anaesthesia machine, surgical instruments and lab equipment and a recovery room will be established.		

3. Action Timeline for Vulture Safe Zone Implementation (VS) Part-I

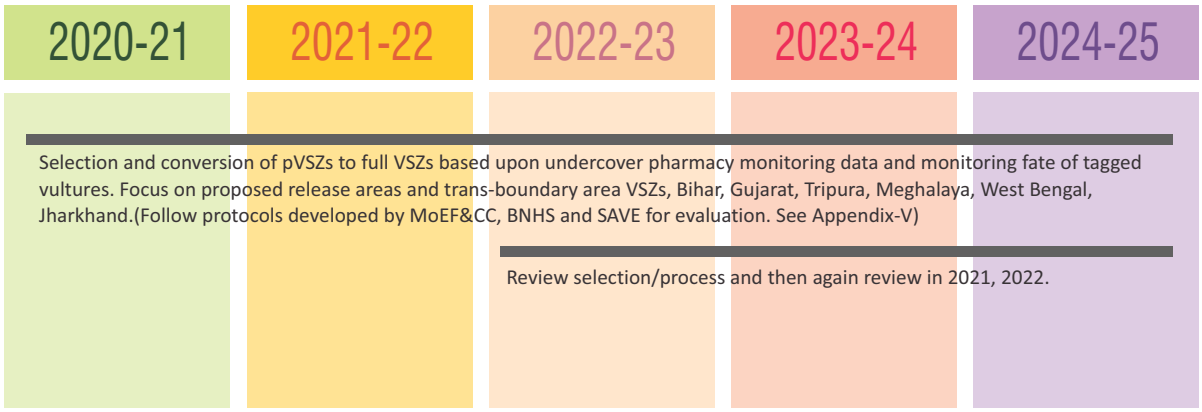
Timeline code	VS-1
Action	Identification and selection of new provisional vulture safe zones (pVSZs) for all the species.
Responsible Agencies	BNHS, NGO State Forest Departments
Budget(in crore Rs.)	5.00



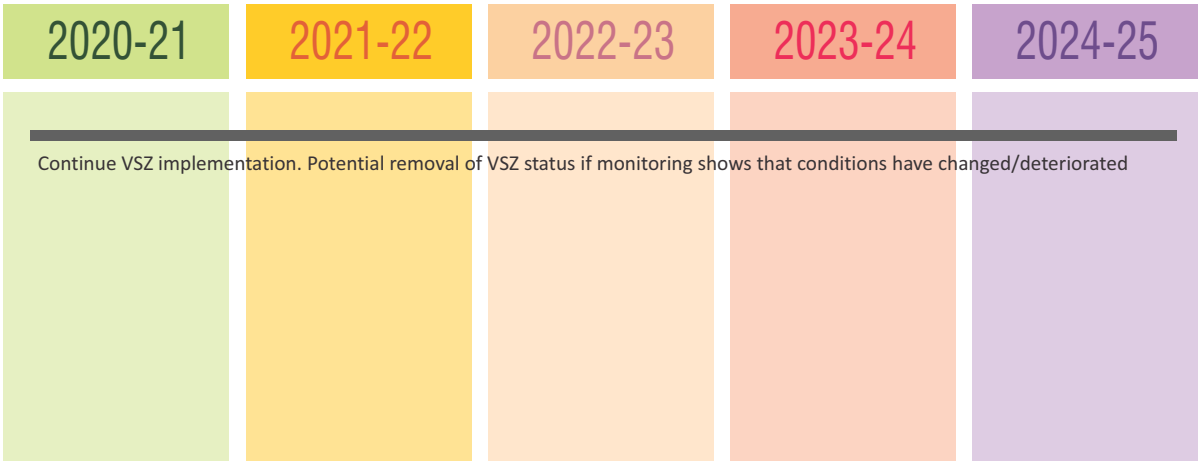
Timeline code	VS-2
Action	Capacity building & local advocacy of provisional Vulture Safe Zones (pVSZs).
Responsible Agencies	BNHS, State Governments, Local NGOs
Budget(in crore Rs.)	5.00

3. Action Timeline for Vulture Safe Zone Implementation (VS) Part-I

Timeline code	VS-3
Action	Selection of pVSZs in India suitable for conversion to full VSZs.
Responsible Agencies	BNHS, State Forest Departments, SAVE
Budget(in crore Rs.)	1.50

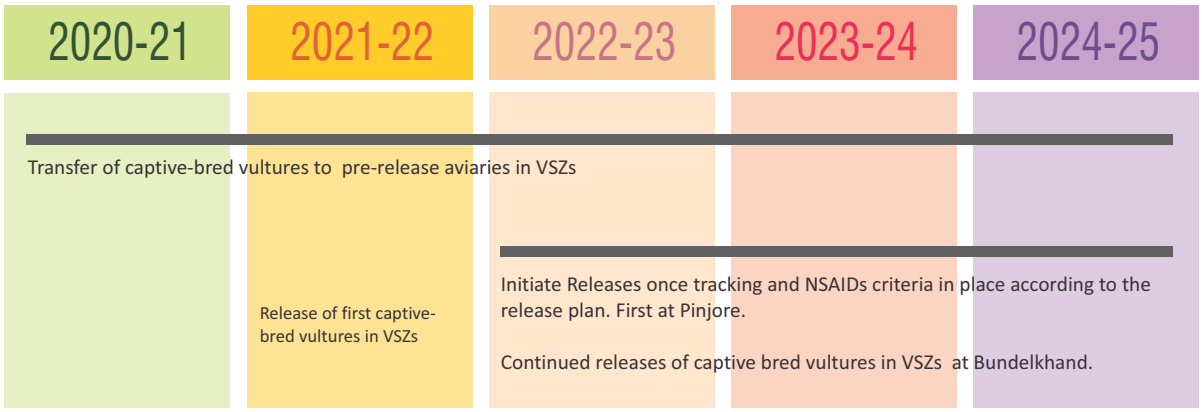


Timeline code	VS-4
Action	Maintenance and review of VSZs
Responsible Agencies	BNHS, State Forest Departments
Budget(in crore Rs.)	2.00



3. Action Timeline for Vulture Safe Zone Implementation (VS) Part-I

Timeline code	VS-5
Action	Release of captive bred vultures in VSZs
Responsible Agencies	BNHS, State Forest Departments, CZA, MoEF&CC
Budget(in crore Rs.)	3.50



4. Activity Timeline for Research and Monitoring (RM)

Timeline code	RM-1
Action	Nationwide Road Transect surveys of vulture number
Responsible Agencies/stakeholders	MoEF&CC, BNHS, Forest Departments of various States
Budget(in crore Rs.)	0.50

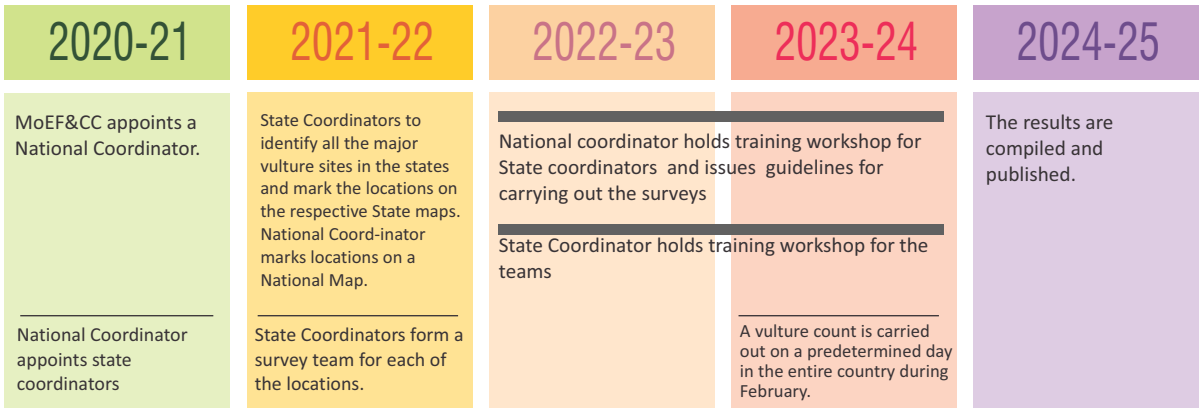
2020-21	2021-22	2022-23	2023-24	2024-25
Conduct Road Transect Surveys by following the same method as done during previous surveys. The surveys are conducted every four years. Last survey was conducted in 2015. (Prakash et al. 2007, 2015)		Compile and Analyse data and publish results in good scientific journal		Conduct Road Transect Surveys by following the same method as done during previous surveys. The surveys are conducted every four years.

Timeline code	RM-2
Action	Carry out total count surveys at district levels in certain States like Gurajat and M.P.
Responsible Agencies	MoEF&CC, Forest Department of Gujarat and Madhya Pradesh, GEER Foundation, local NGOs, Forest Staff
Budget(in crore Rs.)	0.50

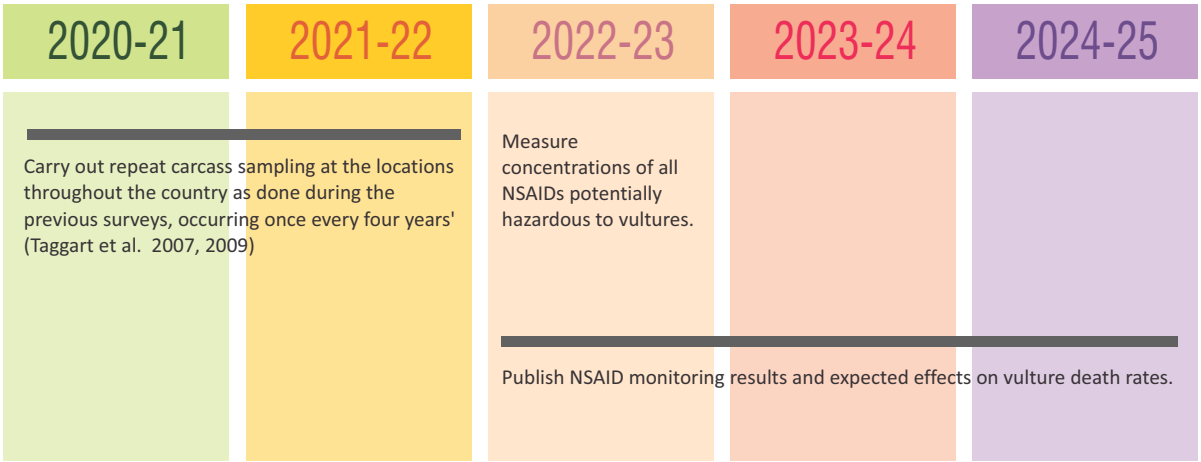
2020-21	2021-22	2022-23	2023-24	2024-25
Carry out surveys as has been done in previous years.(Kamboj et. al. 2019)		Compile and Analyse data and publish results in peer-reviewed scientific journal		Carry out surveys as has been done in previous years. Conduct it in a year when Nation-wide surveys are carried out

4. Activity Timeline for Research and Monitoring (RM)

Timeline code	RM-3
Action	Coordinated Vulture Counts in the country every four years.
Responsible Agencies	MoEF&CC, CWLWs of all States, BNHS, SACON, IBCN
Budget(in crore Rs.)	15.00

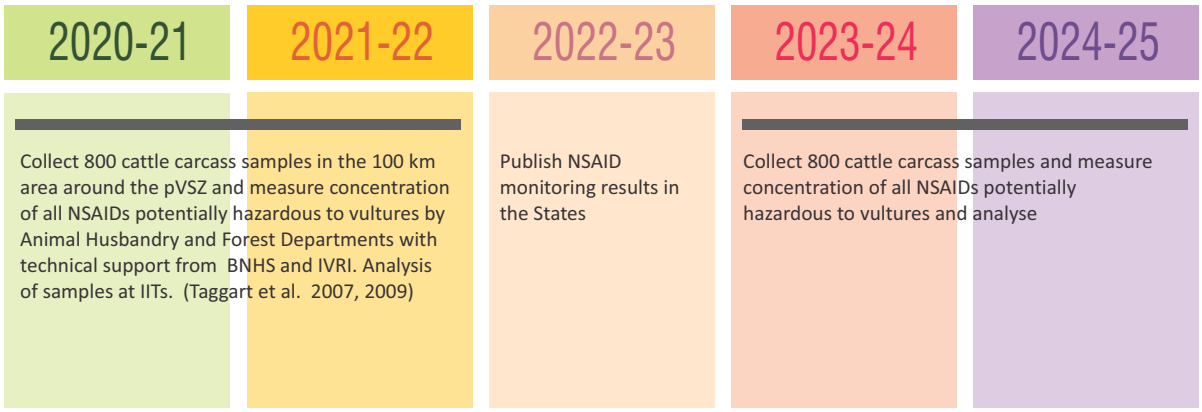


Timeline code	RM-4
Action	Monitoring of NSAID contamination of ungulate carcasses every four years
Responsible Agencies	BNHS, IVRI, State Governments, Animal Husbandry Departments of all States, IITs
Budget(in crore Rs.)	1.00



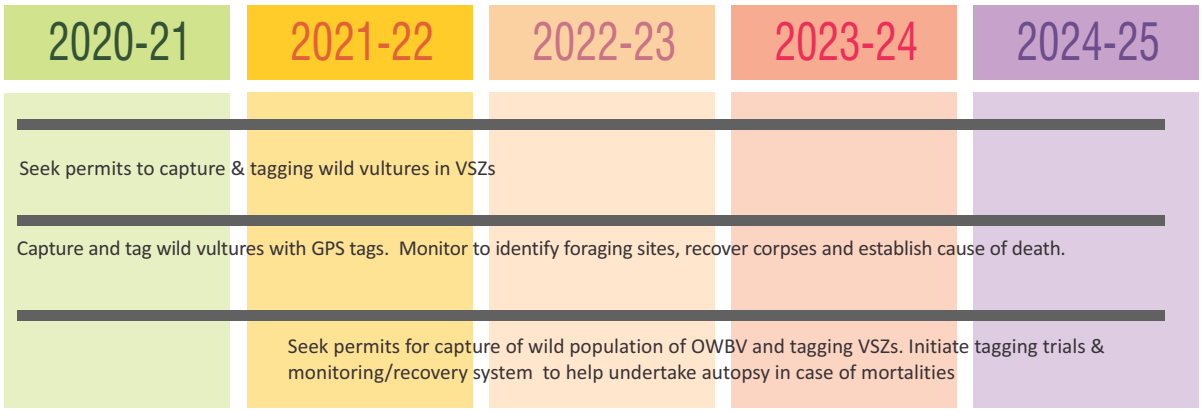
4. Activity Timeline for Research and Monitoring (RM)

Timeline code	RM-5
Action	Monitoring of NSAID contamination of ungulates in all the VSZs once in two years
Responsible Agencies	BNHS, IVRI, State Forest Departments, Animal Husbandry Departments of all States, IITs
Budget(in crore Rs.)	01.00

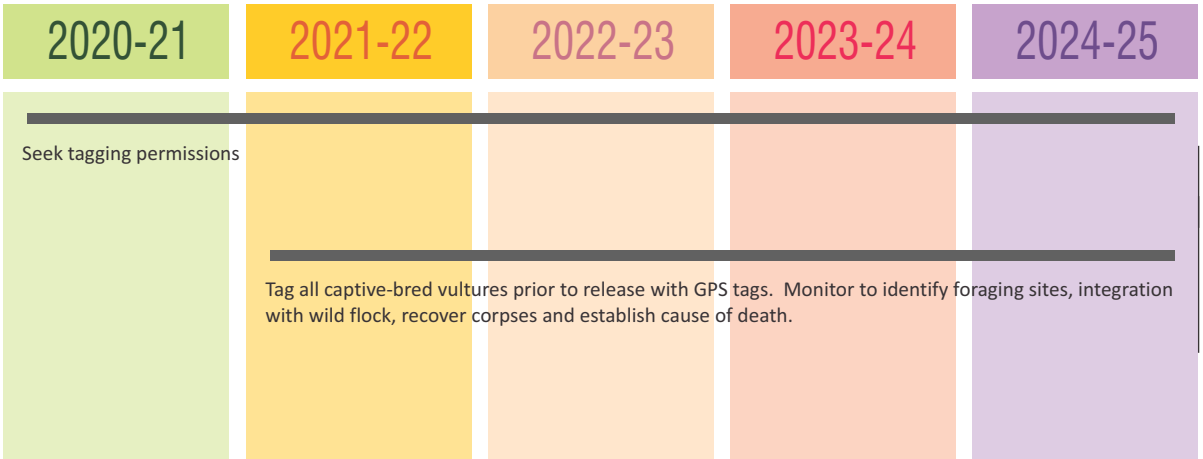


5. Action Timeline for Vulture Safe Zone Monitoring (ZM)

Timeline code	ZM-1
Action	Monitoring movements, survival and causes of death of wild vultures with GPS satellite tags
Responsible Agencies/stakeholders	BNHS, Forest Departments of various states, Local NGOs.
Budget(in crore Rs.)	2.00

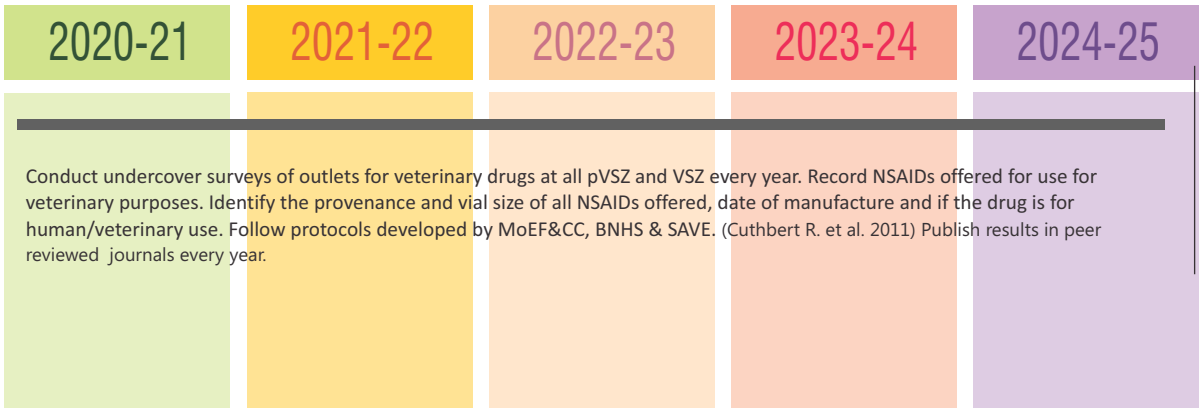


Timeline code	ZM-2
Action	Monitoring of survival and causes of death of released vultures with GPS PTTs in pVSZs and VSZs.
Responsible Agencies	BNHS, IVRI, Forest Departments of various States
Budget(in crore Rs.)	1.00

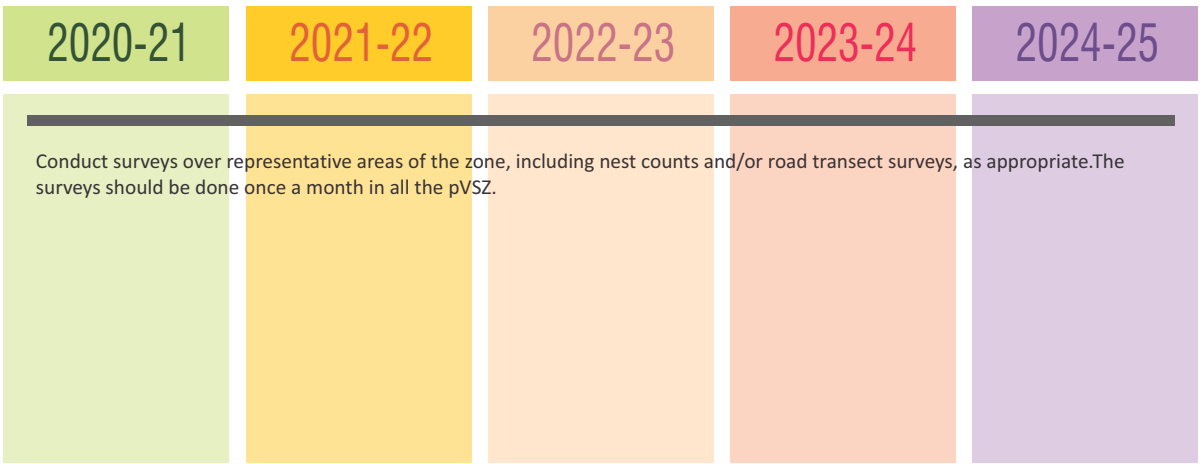


5. Action Timeline for Vulture Safe Zone Monitoring (ZM)

Timeline code	ZM-3
Action	Monitoring availability of NSAIDs for veterinary use in representative samples of pharmacies and other outlets in pVSZ and VSZ
Responsible Agencies/stakeholders	BNHS, IVRI, State Forest Departments, local NGOs
Budget(in crore Rs.)	1.00



Timeline code	ZM-4
Action	Monitoring of wild vulture populations and breeding success in pVSZs and VSZ
Responsible Agencies	BNHS, Forest Departments of various States
Budget(in crore Rs.)	1.00



6. Advocacy and Implementation at National Level

AD: Minimising other causes of Mortality in Vultures

Timeline code	AD-7
Action	Regulate the sale of Agriculture pesticides/ insecticides/ herbicide
Responsible Agencies/stakeholders	MoEF&CC, Ministry of Chemical and Fertilizer, Ministry of Animal Husbandry, Dairy and Fisheries, Indian Veterinary Research Institute, Indian Toxicological Research Institute, BNHS

2020-21	2021-22	2022-23	2023-24	2024-25
Establish National Committee (NC). Chairman: Secretary MoEF&CC Members: Commissioner, Animal Husbandry, Director, Indian Toxicological Research Institute, Representative of Ministry of Agriculture, BNHS	The NC issues guidelines and notification for the use and application of all agriculture pesticide according to the Insecticide Act 1968 and other relevant acts. Best practises in the use of harmful chemicals in agriculture should be emphasised and only qualified persons should be allowed to use potent pesticides to prevent poisoning of carcasses killed by predators to prevent accidental vulture mortalities. NC should issue guidelines to **Prepare a National database of all the incidences of unintentional poisoning.**	All SC should advice their Agriculture Officers to educate the farmers and other users, the harmful unintential effect of use of potent pesticide. Agriculture Departments should publicise the harmful consequences of the misuse of chemicals for killing predators which killed livestock. There should be periodic meeting specially when the pesticides are used the most with Cattle owners and farmers. **Prepare a National database of all the incidences of unintentional poisoning**	Agriculture officer issues guidelines and directions for the targeted use of chemicals on pests. They should warn against misuse of potent pesticides in agriculture by farmers. Only qualified persons should be allowed to store and use dangerous pesticides. **Update the National database of all the incidences of unintentional poisoning.**	

6. Advocacy and Implementation at National Level

AD: Minimising other causes of Mortality in Vultures

Timeline code	AD-8
Action	Minimise the mortality and accidents of vultures by Power infrastructure including powerlines and windmills.
Responsible Agencies/stakeholders	MoEF&CC, NBA, Ministry of New & Renewable Energy -MNRE, Ministry of Power, Ministry of Animal Husbandry, Dairy and Fisheries, IITs, BNHS

2020-21	2021-22	2022-23	2023-24	2024-25
Establish National committee (NC). Chairman:Secretary MoEF&CC Members: Representative of Power Ministry, NBA, MNRE Commissioner, Animal Husbandry, BNHS	The MoEF &CC should establish a Database on the incidence of vulture mortality caused by power infrastructure. MoEF&CC should advice the Ministry of Power to replace all the electric poles with bird-friendly poles, insulators and should increase the distance between two wires to prevent electrocution.	Effective planning, design and mitigating measures can dramatically reduce the impact of energy infrastructure on avian populations.The BirdLife International (2016b) guidelines on mitigating the effects of Wind Farms and Power Lines should be circulated to Ministry of Power, Government of India, which gives effective guidelines to improve the old power infrastructure and make it bird friendly. **Update the database** NC should review the progress every year		

A flock of Slender-billed vultures and White-backed vultures in a breeding facility

CHAPTER VIII

Estimated Budget for implementation of Action Plan for Vulture Conservation in India: 2020-2025

A. Preventing the poisoning of the cattle carcasses, the principal food of vulture

S.No.	Action	Estimated Budget (INR in Crores)
1	Ensuring sale of veterinary NSAIDS only on prescription	2.50
2	Ensuring treatment of livestock by qualified veterinarians to avoid overdosing of cattle during veterinary treatment	2.50
3	Safety testing of the drugs on vultures and scavenging birds before a new molecule of veterinary NSAID is launched in the market	5.00
4	Scientific Management of Carcass Dumps	10.00
5	Achieve the ban on the veterinary use of ketoprofen and aceclofenac	1.00
6	To identify, by a robust safety testing and approval process, NSAIDs that are safe for vultures. Currently meloxicam is the only such drug	5.00
	Total	26.00

B. Vulture Conservation Breeding Programme

S.No.	Action	Estimated Budget (INR in Crores)
1	Conservation breeding of OWBV, LBV and SBV at VCBC Pinjore, Haryana and reintroduction programme	22.5
2	Conservation breeding of OWBV, LBV and SBV at VCBC, Rajabhatkhawa, West Bengal and Reintroduction Programme	17.5
3	Conservation breeding of OWBV and SBV at VCBC, Rani, Assam and reintroduction Programme	10.00
4	Conservation breeding of OWBV and LBV at VCBC, Bhopal, Madhya Pradesh	07.5
5	Conservation breeding of OWBV and LBV at VCBC, Junagarh, Gujarat	10.00
6	Conservation breeding of OWBV and LBV at VCBC, Nandankanan, Odisha	10.00
7	Conservation breeding of OWBV and LBV at VCBC, Muta Zoo, Jharkhand	10.00

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Estimated Budget for implementation of Action Plan for Vulture Conservation in India: 2020-2025

B. Vulture Conservation Breeding Programme

S.No.	Action	Estimated Budget (INR in Crores)
8	Conservation breeding of OWBV, Nehru Zoological Park, Hyderabad, Telangana	15.00
9	Establishment of Conservation Breeding Centres for OWBV, LBV & SBV at Gorakhpur in U.P., Tripura, Ram Devara, Karnataka, Coimbatore, Tamil Nadu, Nashik, Maharashtra	35.00
10	Establishment of Conservation Breeding Centre for Red-headed Vulture, Sarcogyps calvus	05.00
11	Establishment of Conservation Breeding Centre for Egyptian Vulture, Neophron percnopterus gingianus	05.00
12	Vulture rescue and rehabilitation centre	10.00
	Total	**157.50**

C. Action Timeline for Vulture Safe Zone Implementation

S.No.	Action	Estimated Budget (INR in Crores)
1	Identification and selection of new provisional vulture safe zones(pVSZs) for all the species	5.00
2	Capacity building & local advocacy of pVSZs	3.00
3	Selection of pVSZs in India suitable for conversion to full VSZs and Review	1.00
4	Maintenance and review of VSZs	1.00
5	Release of captive bred vultures	2.00
6	Monitoring movements, survival and causes of death of wild vultures with GPS satellite tags	2.00
7	Monitoring of survival and causes of death of released vultures with GPS PTTs in pVSZs and VSZs	1.00
8	Monitoring availability of NSAIDs for veterinary use in representative samples of pharmacies and other outlets in pVSZ and VSZ	0.50
9	Monitoring of wild vulture populations and breeding success in pVSZs and VSZ	0.50
	Total	**16.00**

Estimated Budget for implementation of Action Plan for Vulture Conservation in India: 2020-2025

D. Activity Timeline for Research and Monitoring

S.No.	Action	Estimated Budget (INR in Crores)
1	Nation-wide Road Transect surveys of vulture number	00.50
2	Carry out Total Count surveys at district levels in certain States like Gujarat and Madhya Pradesh	00.50
3	Coordinated Vulture Counts in the country every four years	05.00
4	Monitoring of NSAID contamination of ungulate carcasses every four years	02.00
	Total	**08.00**
	E. Grand Total. A+B+C+D	**207.50**

Adult Long-billed vulture

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Flock of vultures in colony aviary of Vulture Conservation Breeding Centre

APPENDIX I

Status and Distribution of Vultures in India

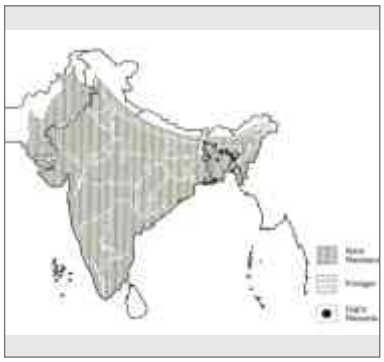
1. Oriental White-backed Vulture Gyps bengalensis

Weight: 3.5-6 kg.

Wingspan: 205-220 cm.

Breeding: 1 egg, in trees, incubation about 55 days, chick fledges about 4 months.

Status: Critically endangered since 2002 and is also in Schedule-I of Wildlife Protection Act, 1972.



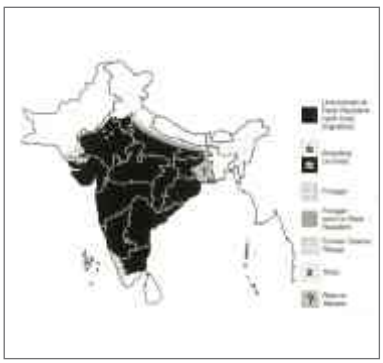
2. Long-billed vulture Gyps indicus

Weight: 5.5-6 kg.

Wingspan: 205-229 cm.

Breeding: 1 egg on rock ledges, incubation about 55 days, chick fledges about 4 months.

Status: Critically endangered since 2002 and is also in Schedule-I of Wildlife Protection Act, 1972.



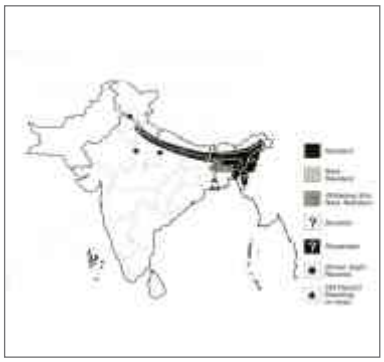
3. Slender-billed vulture Gyps tenuirostris

Weight: 5.5-6 kg.

Wingspan: 205-229 cm.

Breeding: 1 egg, in trees, incubation about 55 days, chick fledges about 4 months.

Status: Critically endangered since 2002 and is also in Schedule-I of Wildlife Protection Act, 1972.



APPENDIX I

Status and Distribution of Vultures in India

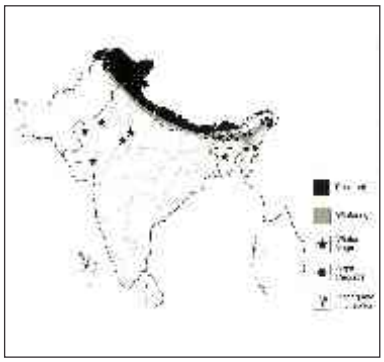
4. Himalayan Vulture Gyps himalayensis

Weight: 8-12 kg.

Wingspan: 260-310 cm.

Breeding: Poorly known, 1 egg, on rock ledges, incubation about 50 days, chicks may fledge 4 to 5 months.

Status: Near threatened and is also in Schedule-IV of Wildlife Protection Act, 1972.



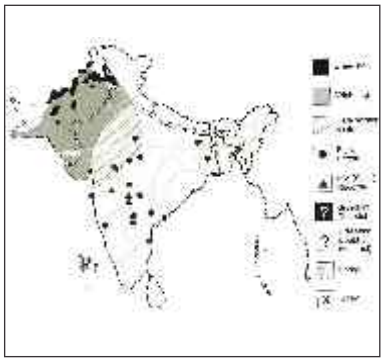
5. Eurasian Griffon Gyps fulvus

Weight: 6-11 kg.

Wingspan: 240-280 cm.

Breeding: 1 egg, in rocks incubation about 50-58 days, chick fledges 110-130 days.

Status: Of least concern and is also in Schedule-IV of Wildlife Protection Act, 1972.



6. Red-headed Vulture Sarcogyps calvus

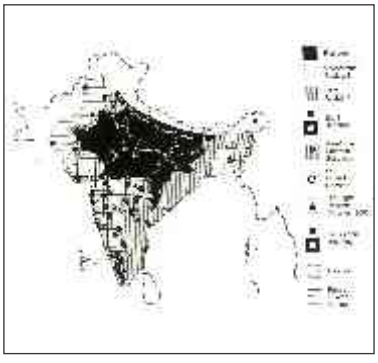
Weight: 3.6-5.4 kg.

Wingspan: 218-229 cm.

Breeding: 1 egg, in tree nest, incubation about 50 days, chick fledges about 4 months.

Status: Critically endangered since 2006 and is also in Schedule-IV of Wildlife Protection Act, 1972.

Photo: Bakul Bhil



APPENDIX I

Status and Distribution of Vultures in India

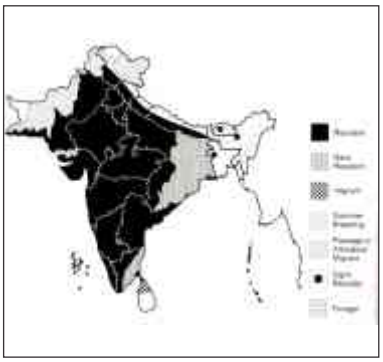
7. Egyptian Vulture Neophron percnopterus

Weight: 1.6-2.2 kg.

Wingspan: 155-170 cm.

Breeding: 1 or 2 eggs, in trees, incubation about 42-45 days, chicks fledge about 3 months.

Status: Endangered since 2006 and is also in Schedule-IV of Wildlife Protection Act, 1972.



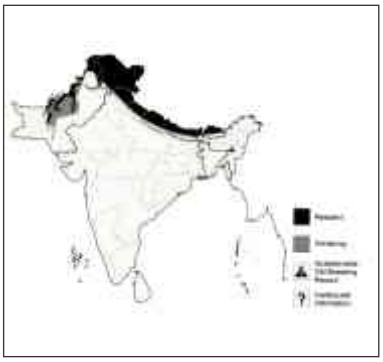
8. Bearded Vulture Gypaetus barbatus

Weight: 4.5-7.1 kg.

Wingspan: 250-282 cm.

Breeding: 1 or 2 eggs, in caves or rock ledges, incubation 53-58 days, chicks fledge 106-130 days.

Status: Near threatened and is also in Schedule-I of Wildlife Protection Act, 1972.



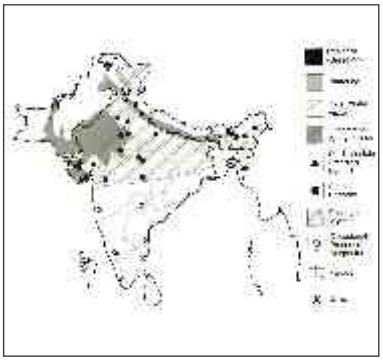
9. Cinereous Vulture Aegypius monachus

Weight: 7-12.5 kg.

Wingspan: 250-295 cm.

Breeding: 1 egg, either in trees or cliffs, incubation 54-56 days, chicks fledge 95-120 days .

Status: Near threatened and is also in Schedule-IV of Wildlife Protection Act, 1972.



Source of Information
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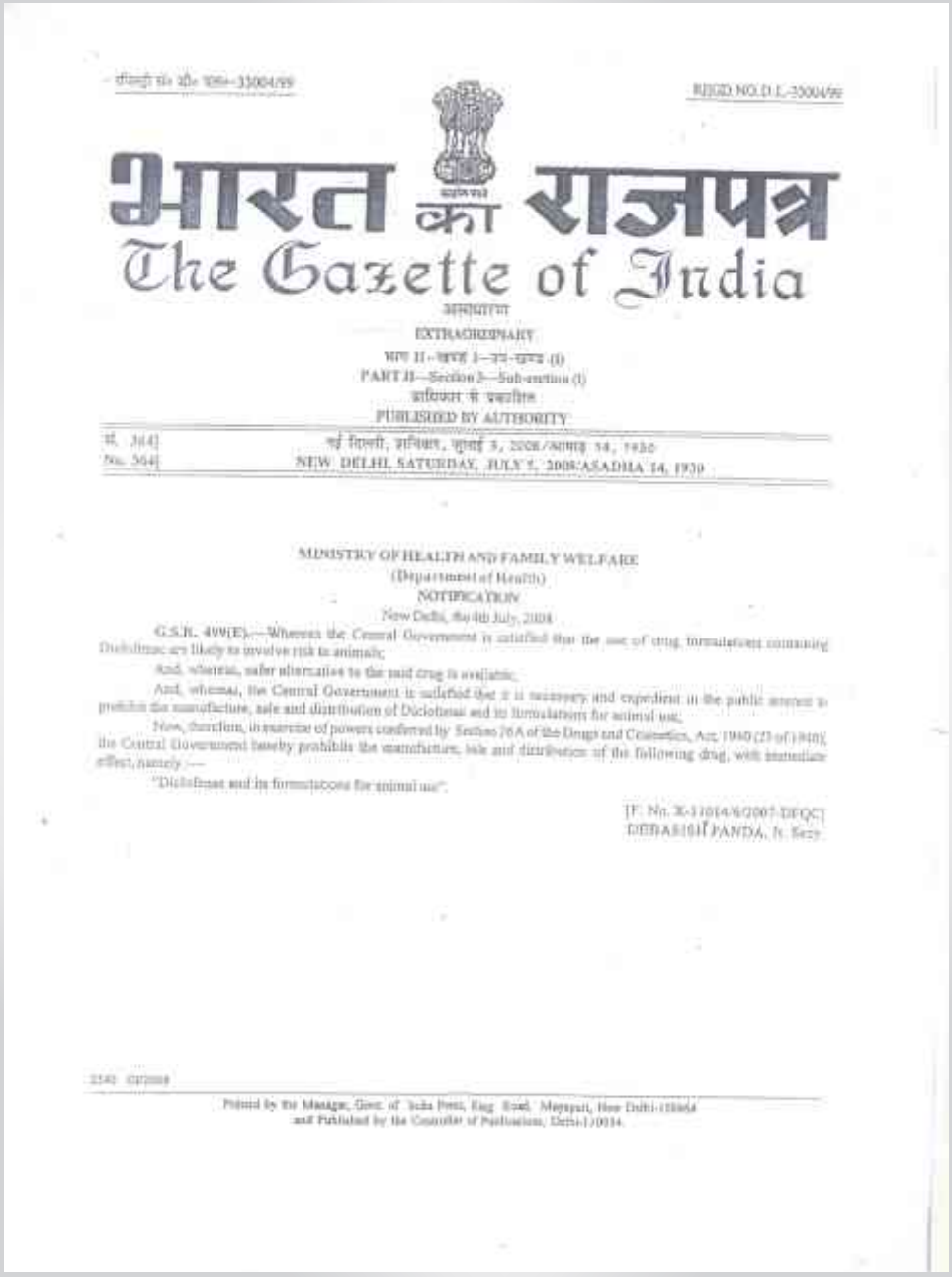
For Distribution Maps
Naoroji , R . (2006) The birds of prey of the Indian Subcontinent . London, UK. Christopher Helm/A&C Black Publishing

APPENDIX II

Ban on diclofenac and its formulations for animal use

Government of India Notification
Dated 5th July 2008



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भारत का राजपत्र
The Gazette of India

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MINISTRY OF HEALTH AND FAMILY WELFARE
(Department of Health)
NOTIFICATION
New Delhi, the 4th July, 2008

G.S.R. 499(E).—Whereas the Central Government is satisfied that the use of drug formulations containing Diclofenac are likely to involve risk to animals;

And, whereas, safer alternatives to the said drug is available;

And, whereas, the Central Government is satisfied that it is necessary and expedient in the public interest to prohibit the manufacture, sale and distribution of Diclofenac and its formulations for animal use;

Now, therefore, in exercise of powers conferred by Section 26A of the Drugs and Cosmetics, Act, 1940 (23 of 1940), the Central Government hereby prohibits the manufacture, sale and distribution of the following drug, with immediate effect, namely :—

"Diclofenac and its formulations for animal use".

[F. No. X-11014/6/2007-DFQC]
DEBASISH PANDA, Jt. Secy.

2542 GI/2008

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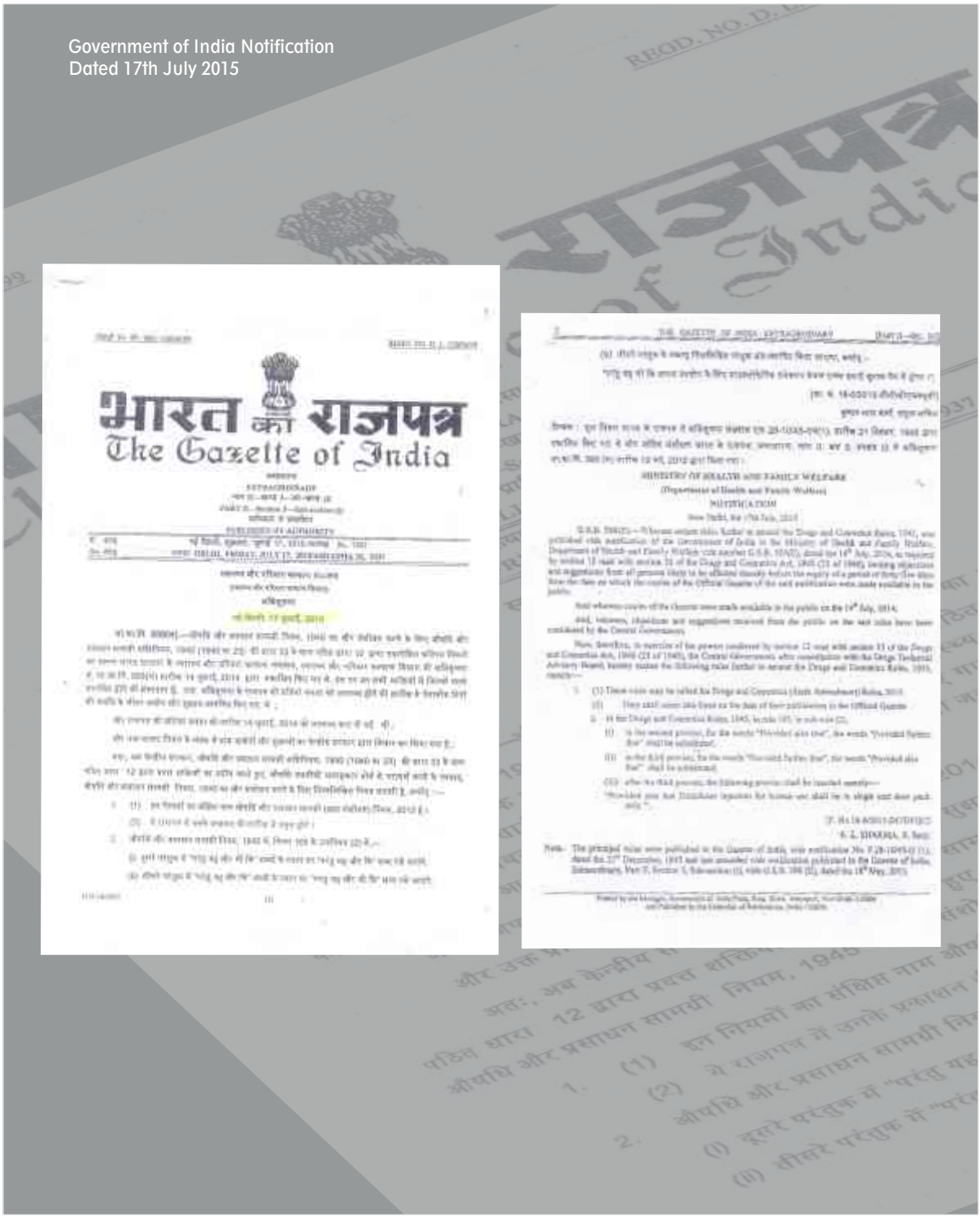
APPENDIX III

Restrictions on the size and of presentation of human formulation to a single unit dose pack

Government of India Notification
Dated 17th July 2015



APPENDIX IV

Manual for Establishing Vulture Conservation Breeding Programme & Rescue Centres

1. Prakash, V., Prakash, N., Kulkarni, M., and Shringarpure, R. (2012). Working Manual on the Vulture Conservation Breeding Programme. Central Zoo Authority, Ministry of Environment, Forests and Climate Change, Government of India

APPENDIX V

The Vulture Safe Zone Approach

A VSZ focusses efforts on priority actions in order to remove diclofenac and other vulture-toxic NSAIDs for a network of areas where vultures persist.

In order to ensure that wild vulture populations recover and that a safe environment exists for captive-bred vultures to be released, the veterinary use of diclofenac and other similarly vulture-toxic NSAIDs have to be eliminated. This is a huge challenge, but one that must be undertaken to prevent the extinction of these iconic birds. Bird Conservation Nepal was the first to pioneer the concept of Vulture Safe Zone (VSZ). A VSZ focuses efforts on priority actions in order to remove diclofenac and other vulture-toxic NSAIDs for a network of areas where vultures persist.

Every VSZ that is set up is referred to as 'provisional'; only when there is complete assurance that the threats of diclofenac and other vulture toxic NSAIDs have been removed from the zone will it be declared a true VSZ.

STAGES IN VSZ WORK

1. DEFINING THE AREA

Each provisional VSZ is centered around at least one surviving nesting colony of at least two of the nine species of vultures. Based on range sizes of Oriental White-backed Vultures, determined using satellite telemetry, a VSZ is demarcated to cover an area that has a radius of at least 100 km in every direction from a colony. This equals a total area of over 30,000 sq. km. therefore, creating a VSZ is a major undertaking.

2. BUILDING A VSZ TEAM

Once an area has been identified, the next step is to assemble a team of conservation biologists and advocacy officers, and build their capacity for advocating vulture conservation and raising awareness regarding the problem caused by vulture toxic drugs, among decision makers and stakeholders.

3. KEY ACTIVITIES TO CREATE A VSZ

The key to ensuring an area as safe for vultures is strong advocacy with decision makers and raising awareness regarding toxic NSAIDs among sellers and other users like pharmacists, veterinarians, para-vets, untrained veterinarians and livestock owners. A range

of meetings with officials is an important starting point, succeeded by follow-up meetings with a wider range of State and District level officials, starting with those from the Forest and Environment, Food and Drug Administration including Drug Controllers, and Animal Husbandry Departments.

In addition, targeting the entire network of veterinarians and para-vets, livestock officials, drug inspectors, and dairy cooperatives at the grass root level, as well as the invisible network of untrained vets within a local community is also relevant.

4. EVALUATING A VSZ

Evaluating a VSZ is crucial to create a safe area for vultures (i.e. free from vulture-toxic NSAIDs). The prevalence of NSAIDs in VSZs may be measured in two ways.

I. PHARMACY SURVEYS

The first step to evaluating a VSZ is to survey pharmacies throughout the VSZ. The pharmacy surveys are then repeated annually, visiting the same settlements as in previous years, and monitoring changes in drug offered for sale. In settlements where diclofenac and other vulture toxic NSAIDs are found, it is important to increase advocacy and awareness work before undertaking the next survey.

II. TESTING LIVER SAMPLES FROM CATTLE CARCASS

When pharmacy surveys stop finding diclofenac and other vulture-toxic NSAIDs on sale, other forms of monitoring will be employed, specifically surveys of NSAID prevalence in the carcasses of domesticated ungulates and vultures.

5. DECLARING AN AREA AS VULTURE SAFE ZONE

An area could be declared a VSZ, which after 2 years of search ensures:

1. No diclofenac or visceral gout found in dead vultures within the area, and
2. Vulture populations within the VSZ are either stable or increasing.

Juvenile White-backed vulture

APPENDIX VI

Regional Declaration

Regional Declaration on the Conservation of South Asia's Critically Endangered Vulture Species

DELHI, 4 MAY 2012

We, the Government Representatives taking part in the Symposium on Developing a Regional Response to the Conservation of South Asia's Critically Endangered Vulture Species, held in Delhi from 3-4 May 2012, hereby adopt this regional declaration.

Government of the People's Republic of Bangladesh,
Government of India
Government of Nepal
Government of Pakistan

Regional Declaration on the Conservation of South Asia's Critically Endangered Vulture Species

RECALLING that vultures are specialized scavengers that provide a critically important ecosystem service by removing carcasses of livestock and wild animals, and carrion from the environment;

FURTHER RECALLING that vultures are an integral part of the cultures of South Asian countries, and play a central role in several of the region's ancient religious traditions;

RECOGNIZING that South Asia's populations of Long-billed Vulture (Gyps indicus), Slender-billed Vulture (Gyps tenuirostris) and White-rumped vulture (Gyps bengalensis) have declined by more than 99 per cent since the early 1990s;

NOTING that IUCN (International Union for Conservation of Nature) has listed all three species as Critically Endangered on the IUCN Red List;

FURTHER NOTING that IUCN called for urgent measures to be taken to conserve these species, in Resolution 3.079 on the Conservation of Gyps Species of Vultures in South and Southeast Asia, adopted at the IUCN World Conservation Congress in Bangkok in 2004;

RECALLING Aichi Biodiversity Target 12, which calls for all countries and stakeholders to prevent the extinction of known threatened species by 2020 and to improve the conservation status of those species most in decline;

FURTHER NOTING that these rapid declines have been caused by human activities, in particular, the use of diclofenac (a non-steroidal anti-inflammatory drug) in the livestock sector;

COMMENDING the important steps that have already been taken by Governments, scientific bodies, non-governmental organizations, international organizations and the private sector, including:

- the ban on veterinary diclofenac in Bangladesh, India, Nepal and Pakistan;
- the establishment of conservation breeding centres in India, Nepal and Pakistan;
- the initiation of "vulture safe zones" together with safe vulture feeding sites in several countries;
- the promotion of research and monitoring of the vulture population;

FURTHER COMMENDING the activities of SAVE (Saving Asia's Vultures from Extinction) and its members for their notable contributions to vulture conservation in the region;

RECOGNIZING the need to intensify and significantly expand the aforesaid efforts in order to ensure the recovery of South Asia's wild vulture populations;

ALSO RECOGNIZING that there is an important need for enhanced regional collaboration, information sharing, exchange of experiences and lessons learned

on conservation of vultures in South Asia; We, the participants at the Symposium on Developing a Regional Response to the Conservation of South Asia's Critically Endangered Vulture Species, held in Delhi from 3-4 May 2012, hereby agree to:

1) STRENGTHEN regional cooperation by
- Establishing a South Asia Regional Steering Committee for Vulture Conservation
- Taking active steps to enhance information sharing and exchange of experience among all vulture range countries, in all aspects of in-situ and ex-situ vulture conservation in South Asia

2) STRENGTHEN vulture conservation breeding and reintroduction programmes by
- Ensuring rapid dissemination of information relating to successful techniques and approaches amongst all centres in the region
- Seeking to maintain and increase the level of financial and technical support for conservation breeding received from Governments, international organizations and donors, so as to deliver the objectives for the annual production of captive-bred young
- Planning and implementing the necessary measures required at release sites

3) CREATE AND MAINTAIN a non-toxic environment for vultures by
- Removing diclofenac and other toxic NSAIDs completely from the vulture food chain, through measures including enhanced enforcement of the ban on veterinary use of diclofenac and eliminating its "leakage" from human use by urgent measures and legislation, as appropriate, against multi-dose vials of human diclofenac
- Identifying and preventing the veterinary use of other non-steroidal anti-inflammatory drugs with similar toxicity to vultures as diclofenac, such as ketoprofen and aceclofenac (a pro-drug of diclofenac)
- Continuing efforts to identify, promote and adopt safe alternatives to diclofenac, such as meloxicam;
- Monitoring and assessing the impacts and effects of other livestock drugs on vultures, leading to active steps for preventing use of the drugs that have negative impact on vultures
- Fully enforcing the legal ban on the manufacture of veterinary formulations, retail sale and use for veterinary purposes of diclofenac;

4) STRENGTHEN conservation measuresby
- Increasing the number, size and effectiveness of national "vulture safe zones", within which special efforts are made to remove all toxic veterinary drugs from the food chain of vultures
- Cooperating to create trans-boundary vulture safe zones, knowing that political borders do not stop vultures from crossing international borders while searching for food
- Enhancing the protection and management of vulture habitats and vulture roosting and nesting sites;

5) CONTINUE AND EXPAND strategically-designed awareness and advocacy campaigns, aimed at building support for vulture conservation amongst all stakeholders at local, national, regional and international levels

6) STRENGTHEN monitoring and research by
- Continuing and expanding efforts to monitor vulture populations and breeding success on a regular and repeatable basis using road transect surveys and nest monitoring
- Continuing and expanding efforts to monitor and quantify diclofenac and other toxic drugs in cattle1 carcasses
- Determining the safety and toxicity of veterinary NSAIDs, if necessary by experiments on captive vultures
- promoting studies on all possible causes of decline of wild vulture populations
- Promoting studies on vulture behaviour and ecology

7) CONTINUE to develop and foster active partnerships amongst Governments, research institutions, civil society, private sector and international organizations to further accelerate vulture conservation in the region.


JATAYU
SOLICITS
JUDICIOUS USE OF
VETERINARY DRUGS
FOR ITS
SURVIVAL

Adult Long-billed vulture

सत्यमेव जयते

प्रकृति रक्षति रक्षितः
Nature Protects if She is Protected

Ministry of Environment, Forest and Climate Change
Government of India