



ACTION PLAN FOR VULTURE CONSERVATION IN INDIA

**Ministry of Environment & Forests
Government of India**

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1. **Background:** India has nine species of vultures in the wild. These are the Oriental White-backed Vulture (*Gyps bengalensis*), Slender billed Vulture (*Gyps tenuirostris*), Long billed Vulture (*Gyps indicus*), Egyptian Vulture (*Neophron percnopterus*), Red Headed Vulture (*Sarcogyps calvus*), Indian Griffon Vulture (*Gyps fulvus*), Himalayan Griffon (*Gyps himalayensis*), Cinereous Vulture (*Aegypius monachus*) and Bearded Vulture or Lammergeier (*Gypaetus barbatus*). The population of three species i.e. White-backed Vulture, Slender billed Vulture and Long billed Vulture in the wild has declined drastically over the past decade. The decline of *Gyps* genus in India has been put at 97% by 2005.

Because of the evidence of widespread and rapid population decline, all three vulture species were listed by IUCN, the World Conservation Union, in 2000 as 'Critically Endangered', which is the highest category of endangerment. This assessment indicated a high risk of global extinction in the wild in the near future. Unfortunately, the current captive populations in India are also not viable for any of the species and, therefore, complete extinction is likely to occur if no action is taken immediately. India also moved a IUCN motion in 2004 for vulture conservation, which was accepted in the form of the IUCN resolution which "called upon *Gyps* vulture Range countries to begin action to prevent all uses of diclofenac in veterinary applications that allow diclofenac to be present in carcasses of domestic livestock available as food for vultures; establishment of IUCN South Asian Task Force under the auspices of the IUCN; Range countries to develop and implement national vulture recovery plans, including conservation breeding and release."

2. **Significance for Human Well-Being:** The ecological, social and cultural significance of vultures in India may be summed up as: scavenging on animal carcasses of animals and thereby helping keep the environment clean; and the disposal of dead bodies as per the religious practices of the Parsi community. Vultures are the primary removers of carrion in India and Africa. Removal of a

major scavenger from the ecosystem will affect the equilibrium between populations of other scavenging species and/or result in increase in putrefying carcasses. In the absence of carcass disposing mechanisms, vulture declines may lead to an increase in the number of putrefying animal carcasses in the country side. In some areas the population of feral dogs, being the main scavenging species in the absence of vultures, has been observed to have increased. Both increases in putrefying carcasses and changes in the scavenger populations have associated disease risks for wildlife, livestock and humans. In the absence of any alternative mode of disposal of animal carcasses, they continue to be disposed off in the open, and with increasing numbers of feral dogs, there is increased risk of spread of rabies, and livestock borne diseases like anthrax (Prakash *et al*, 2003). The decline in vultures has also affected the traditional custom of the Parsis of placing their dead in the 'Towers of Silence' for vultures to feed upon.

3. Status of Population of Gyps Vultures in the Indian Subcontinent:

Surveys on the population status of vultures have been carried out and reasons for their sudden decline studied by various avian experts. Decline of vulture populations in India was first recorded at the Keoladeo Ghana National Park, Rajasthan during mid 1980's to mid 1990's, followed by Northern India road counts. Declines have been projected in excess of 97% over a 12 year period in India and 92% in a 3 year period in Pakistan (Virani, 2006). Nepal has also experienced similar reductions. A dramatic decline of two species, *G. bengalensis* and *G. tenuirostris* was noticed in Nepal since the mid-1990s, when an estimated >150,000 pairs of White-rumped Vulture were known to breed. There are now less than 1000 pairs of the Slender-billed Vultures in Nepal. The current rate of annual decline in Nepal is estimated to be 40% and the rate of decline within a decade is estimated at 90 to 95% (Nepal country report, 2006).

In Bangladesh, the *Gyps bengalensis* is threatened and *Gyps indicus* and *Gyps fulvus* are now rare (Bangladesh country report, 2006). Populations of *Gyps*

bengalensis and *Gyps tenuirostris* in South-East Asia (Cambodia, India, Laos PDR, Myanmar, Nepal, Pakistan and Vietnam) are low, but declines are thought to have been historical and slower, rather than recent and rapid. World population size is not known for any of these species.

3.1 Symptoms of Morbidity:

The phenomenon of 'Neck drooping', though reported in Eurasian vultures, had never been observed in India before the period of decline. 'Neck drooping' was first observed in Keoladeo National Park, where birds would exhibit this behaviour for protracted periods over several weeks before collapsing and falling out of trees, at the point of, or just prior to death (Prakash, 1999) This is an important behaviour to monitor, as it is the only obvious behavioural indication that birds are ill. Even where this is reported in healthy birds under hot conditions, it is likely that it will be recorded more frequently in populations with a higher proportion of sick or weak birds.

4. The Probable Cause of the Sudden Decline in Vultures Population:

The Asian vulture population crash was first revealed in 1999 with investigations on the cause of decline beginning in 2000. In India, the initial hypotheses for the drastic decline in population were non-availability of food (dead livestock) as they were perhaps being removed for commercial purposes, or an unknown viral epidemic disease. The former was clearly not the case. Investigations on the hypothesis of epidemic disease were carried out by the BNHS, IVRI and other institutions in India in association with researchers working abroad on the issue. Visceral gout, an accumulation of uric acid within tissues and on the surfaces of internal organs, was observed in 85% of dead vultures found. Death was caused by renal failure, which is known to occur as a result of metabolic, infectious or toxic disease. Visceral gout was observed in approximately 85% of dead adult

Microscopy, Molecular Biology, Bacteriology, and Transmissibility all gave negative results. Histopathology revealed that in all cases there was severe renal tubule damage, which became acute in 1-4 days, and minimal inflammation, indicating a toxic cause. However toxicological studies did not indicate heavy metal poisoning, toxic residues of organophosphates, or organo chlorines. Accordingly, no conclusive evidence of epidemic disease was found.

4.1 Identification of Diclofenac as the Probable Cause:

An alternative hypothesis was the introduction of a new risk factor in the environment, to which the birds were exposed, just prior to the onset of decline in vulture populations. A candidate was the veterinary analgesic drug Diclofenac, which was introduced for veterinary use in the late 1980s in the subcontinent, and to which vultures could plausibly be exposed through consumption of carcasses of livestock treated with the drug, provided that sufficient concentrations of unmetabolized Diclofenac remained. Further work on this hypothesis was carried out in India and Pakistan by several organizations, including the BNHS, Peregrine Fund, and RSPB.

Experiments showed that captive vultures are highly susceptible to Diclofenac, and are killed by kidney failure within a short time of feeding on the carcass of an animal treated with the normal veterinary dose. Veterinary drugs used routinely as well as those new in the market were surveyed extensively to identify those that could damage kidneys and only Diclofenac stood out. Residue analysis in kidney samples showed a perfect 100% correlation between gout and Diclofenac residues. Further, vultures fed either Diclofenac or treated buffalo carcasses, died of gout. They had the exact same pathology and tissue residues as the wild cases, the frequency of mortality being dose-dependent (Oaks, 2006).

4.1.1 Modeling Results:

Comparison between observed proportions of dead vultures that had symptoms of Diclofenac poisoning and modeling results provides a useful test of the

hypothesis that Diclofenac poisoning is the sole or main cause of the population decline. A Demography Simulation model indicates that a low incidence of contamination of ungulate carcasses available to vultures with lethal levels of Diclofenac (0.13-0.75% concentrations, depending on model assumptions and vulture population) is sufficient for Diclofenac poisoning to be the sole cause of the observed vulture declines. The observed proportions of dead

5. Actions Taken so Far

Consequent to the identification of exposure to Diclofenac as the most probable cause of decline of the population of vultures, a series of workshops and meetings were held in India and abroad to enhance awareness among scientists and policy makers about the fact of decline, the role of Diclofenac, and to discuss possible steps to address the problem. The workshops recommended that conservation programmes should be initiated urgently along with immediate dialogue for phasing out the veterinary use of the Diclofenac. Some of the significant events in this regard may be summed up as follows:

i. International workshop at Kathmandu, Nepal in February 2004:

During the workshop, the Indian delegation proposed to convene a national level workshop with participation by the representatives of pharmaceutical companies, veterinarians, and local and international experts, etc., to work out an implementable action plan for phasing out the use of Diclofenac and simultaneous substitution with viable and effective alternates.

ii. Workshop at Parwanoo, Haryana in February 2004: to develop a recovery plan for the vultures in South Asia, focusing on three species i.e. White-backed Vulture, Slender billed Vulture and Long billed Vulture. The aims of the action programme included i) to remove the causes of vulture declines by 2010 and ii) to establish self sustaining populations of vultures in the wild by 2030. The principle sectors of focus were i) veterinary drug use, ii) monitoring and research, iii) public awareness and training and iv) population status

iii. National Workshop at New Delhi in April 2004: to prepare a National Action Plan for conservation of the three species of vultures. The workshop was attended by Chief Wildlife Wardens, BNHS, SACON, Drugs Controller of India, Department of Animal Husbandry, Ministry of Chemicals and Fertilisers,

Pharmaceutical Companies, IVRI, USFWLS, RSPB and Peregrine Fund. In principle agreements were reached on:

- Phasing out veterinary use of Diclofenac and its substitution by alternative drugs.
- Testing of alternative veterinary drugs by IVRI for assessing the impact on vultures and other scavengers prior to possible authorization for veterinary use.
- State Governments to work out comprehensive State level plans for effective conservation of vultures and withdrawal of veterinary Diclofenac immediately.
- Department of Animal Husbandry and Ministry of Health to replace veterinary Diclofenac in a phased manner with tested substitutes, initiate action to reduce the excise duty and sales tax on substitutes to make them cost-effective, reduce subsidy on veterinary Diclofenac, and immediately substitution of Diclofenac by older established drugs while toxicity trials are carried out by IVRI.

iv. Second Meeting of the National Board for Wildlife (NBWL) on 17th March 2005 under the Chairmanship of Hon'ble Prime Minister: It was decided that MoEF would explore the possibility of placing a ban on veterinary Diclofenac in consultation with the Department of Animal Husbandry and Ministry of Health so that the drug may be phased out within 6 months. The meeting also endorsed the preparation of an Action Plan for the Government of India and the States for conservation of vultures.

To give effect to the decision of the NBWL, a series of meetings were held by MoEF with other Ministries (Department of Animal Husbandry, Drugs Controller, Department of Revenue) and stakeholders (Pharmaceutical Cos., Research Institutions) to identify specific measures for phased withdrawal of veterinary Diclofenac and its substitution with tested alternatives.

V. International Conference on Vulture Conservation at New Delhi on 31st January 2006 - 1st February 2006: The Conference was intended for exchange of information on the status of the vulture population in the Range countries of the region, initiatives being taken by various organizations in its conservation, as well as identification of a regional action plan for vulture conservation, building on the respective national Action Plans. The recommendations of the Conference are as follows:

- The Governments of the respective countries may take immediate steps to completely phase out veterinary Diclofenac. This would have to be complemented by aggressive awareness campaigns about the adverse ecological effects of the drug.
- To urgently establish vulture conservation centres, especially for the three endangered species.
- To conduct a reliable population estimate at State, country and regional levels.
- To strengthen education and awareness campaigns.
- To strengthen sharing of information amongst the stakeholders.
- Setting up of a Task Force for the region to collaborate in vulture conservation programmes in the region. The Task Force may include representatives of the Range Countries as nominated by the respective Governments (Bangladesh, Bhutan, Cambodia, India, Myanmar, Nepal, Pakistan), representatives of NGOs actively pursuing vulture conservation in each of the range countries and nominated by the respective governments; IUCN Species Survival Commission, and International research organisations of repute working on vulture conservation.

India thus has been pro-active in initiating and implementing various aspects of vulture conservation in the country, besides promoting regional cooperation on

the issue. This fact has been acknowledged by the international conservation community.

6. Specific Issues in Preparation of an Action Plan for Vulture Conservation:

6.1 Alternatives To Diclofenac:

i. Diclofenac in the Pharmaceutical Market:

Diclofenac is a non-steroidal anti-inflammatory drug (NSAID) used for a variety of painful and inflammatory conditions. Based on reports received from the pharmaceutical industry, the annual total veterinary pharmaceuticals market in the country, as per 2003 estimates, is about Rs 1000 crores. The non-steroidal anti-inflammatory segment accounts for Rs 30 crores, of which Diclofenac has a market of Rs 20 crores, with an expected annual growth rate of 10%. The number of animals being treated annually with Diclofenac injectibles alone is projected at about 10 million (Teng, 2005)

ii. Constraints in Phasing out Veterinary Use of Diclofenac:

Human Use of Diclofenac:

A major issue in the phasing out of veterinary use of Diclofenac is its use in human medicine as an effective anti-inflammatory and analgesic. While there is no reported human medical condition for which Diclofenac is the sole, effective anti-inflammatory analgesic, it is nevertheless true that it is an extremely effective drug in human use. Also, it is possible that a very small number of persons may experience adverse effects with all the close substitutes, and thus may only be administered Diclofenac.

It is thus not feasible to completely phase out human use of Diclofenac, in addition to its veterinary use. So long as human use continues, and so long as

human Diclofenac is a cost-effective substitute alternative to veterinary alternatives of Diclofenac, any steps at terminating veterinary use of Diclofenac would be ineffective because of the possibility of diversion of human Diclofenac formulations to veterinary use.

Considering that the balance of societal well-being considerations would require the conservation of vultures through preventing exposure to Diclofenac, while retaining human use of Diclofenac, a way must be found to prevent diversion of human Diclofenac to veterinary use. Since veterinary use of drugs are known to be very sensitive to considerations of cost, a feasible approach would be to ensure, through appropriate policy instruments, that human Diclofenac is too costly for general veterinary use. If there are some extremely poor patients who may only be treated by Diclofenac, a way must be found to subsidize Diclofenac use in these cases.

iii. Testing Alternative Drugs:

Trials in South Africa (Cuthbert, 2006):

Since the three resident *Gyps* species in Asia (*G. bengalensis*, *G. indicus* and *G. tenuirostris*) were Critically Endangered and Schedule I species under the Wildlife (Protection) Act, 1972 and too rare and too endangered for extensive safety testing, the African white-backed vulture *Gyps africanus* was identified as a surrogate species for Asian *Gyps* vultures. This is the closest relative of Oriental white-backed vulture *G. bengalensis* and is widespread and abundant in Africa. Captive, injured individuals destined for euthanasia were available for safety testing. The same clinical symptoms as *G. bengalensis* were obtained from Diclofenac exposure, confirming at a 98% level of significance that Diclofenac is as toxic for *G. africanus* as for *G. bengalensis*, and hence a suitable surrogate species (Cuthbert, 2006).

A phased programme of safety testing for an alternative drug, Meloxicam, was started on 24 vultures in 3 groups of 8 birds. All birds in phases I-III survived and no adverse reactions were observed in vultures at any administered dose. There was no loss of body weight related to treatment, all blood parameters measured remained within their normal ranges, and there were no significant sub-lethal effects. Meloxicam was thus found to be safe at 2.5 x LD50 of Diclofenac {Lethal

also approved for human use in more than 70 countries. Meloxicam is licensed as a veterinary drug in India, Europe and USA. The patent for Meloxicam has expired and it is already manufactured in India and registered for manufacture in Nepal.

Safety Trials of Meloxicam in India:

A collaborative project between Forest Department, Haryana, IVRI, and BNHS with technical inputs from RSPB was started on 30th June 2005 at the Vulture Conservation and Breeding Centre at Pinjore, Haryana for conducting safety trials on Meloxicam. The target date of completion was 31st March 2006 (Swarup, 2006). However the results would now be obtained very shortly. The study is being carried out in four phases as follows:

- **Phase 1:** To determine whether Meloxicam presents a safety risk to Oriental white backed vulture (*Gyps bengalensis*) and Indian vulture (*G indicus*) at equal and four times the standard veterinary dose rates.
- **Phase II:** To determine whether Meloxicam presents a safety risk to other scavenging birds (Egyptian vulture, cattle egret, wild crow and myena) at four times the standard veterinary dose rates.
- **Phase III:** Safety testing of Meloxicam treated buffalo tissues fed to *Gyps* vultures.
- **Phase IV:** Residues of Meloxicam in buffalo.

Based on results of Phase I and II, it has been concluded that oral administration of Meloxicam at a dose rate equal to or more than the amount the scavenging birds could consume as drug residue though feeding on animal carcass may be considered safe.

6.2 Ex-Situ Conservation Of Vultures:

The workshop to prepare an Asian Vulture Recovery Plan held at Parwanoo in Himachal Pradesh, India in February 2004 recommended the establishment of captive holding and captive breeding facilities for three species of *Gyps* vultures at six different places in South Asia, besides implementing a ban on veterinary use of Diclofenac. These centres would serve as source for reintroduction of the birds after removal of the cause of mortality from the environment. Vulture Breeding and Conservation Centre had already been established at Pinjore, Haryana in 2001 and another one has been established in 2005 at Buxa, West Bengal. The Central Zoo Authority of India has also committed an amount of Rs 1 crore for supporting 4 such centres in the zoos at Junagadh, Bhopal, Hyderabad and Bhubhaneshwar in 2006-07.

These centres would also serve as rescue and analysis centres for sick vultures or carcasses sent for treatment and investigations.

6.2.1 Conservation Breeding Centre, Pinjore, Haryana:

The Vulture Conservation Breeding Centre was established at Pinjore, Haryana in September 2001 by BNHS in collaboration with the Haryana Forest Department. The centre is funded by the Darwin Initiative for the Survival of Species Fund of the Government of UK, (2001-06) and supported by RSPB, ZSL and National Birds of Prey Trust, UK. The species housed at the centre are white-backed vultures (15 adults and 9 juveniles), Long-billed vultures (3 adults and 25 juveniles), Slender-billed vultures (10 juveniles) and the Himalayan griffon (1 adult). These birds have been captured from various States of the country. Each bird is microchipped for identification. The proposed time table for the conservation breeding envisages the capture of birds (60 birds of each species), including nestlings, during the next one year to form the founder population. The first breeding in captivity is expected before 2010 and the first release is

expected in the 2012, if the environment is safe by then. One hundred pairs are projected to be released by the year 2020 (Jakati, 2006).

6.3 Legal Issues in Phasing Out of Diclofenac:

Do sufficient legal powers exist with the Government to terminate use of Diclofenac? The Drugs & Cosmetics Act 1940 was amended in 1982 to empower the Central Govt. to prohibit manufacture and import of drugs under Sec. 26-A and 10A respectively of the Drugs and Cosmetics Act. Sections 10A (Power of Central Govt to prohibit import of drugs and cosmetics in public interest) and 26A of the Act (Power of Central Govt to prohibit manufacture of drugs and cosmetics in public interest) state:

“.....if the Central Govt. is satisfied, that the use of any drug or cosmetic is likely to involve any risk to human beings or animals or that any drug does not have the therapeutic value claimed or purported to be claimed for it orthat the Govt. may, by notification in the Official Gazette prohibit import/manufacture, sale or distribution of such drug or cosmetic”.

Drugs, for which harmful effects are reported, or if therapeutic justification is considered inadequate in the light of current medical evidence, are examined by the Expert Committee under the Drugs Technical Advisory Board (DTAB), which is a statutory Board under the Drugs and Cosmetics Act. Similarly, drugs for animal use are examined by the Directorate General of Health Services, Ministry of Health, in consultation with the Ministry of Agriculture. However such alternative drugs should be identified that are not only safe and effective in livestock, but also safe for vultures and other scavenging birds and animals. As per procedure, once a suitable drug for replacing Diclofenac for veterinary use is identified and concurrence received from the Ministry of Agriculture, manufacture, import, sale, and distribution of Diclofenac for veterinary use may be prohibited under Sections 10A and 26A of the Drugs and Cosmetics Act, 1940 through notification in official Gazette. In terms of the provisions of the Drugs and

Cosmetics Act, if a drug is prohibited due to its adverse effects, withdrawal of the drug is with immediate effect.

The detailed Action Plan for Vultures Conservation in India follows:

7. ACTION PLAN FOR CONSERVATION OF VULTURES IN INDIA

A. Removal of the Main Causative Agent – Diclofenac:

Action	Responsibility	Time Frame for completion	Estimated Cost to Government	Remarks
Completion of safety trials of Meloxicam at Pinjore	BNHS; IVRI Dept of Animal Husbandry	April 2006	Rs 12.00 lakhs provided under the existing budget of IVRI	
Notification of ban on Veterinary use of Diclofenac under Sections 10 A and 26 A of Drugs and Cosmetics Act	Drugs Controller, Ministry of Health & Family Welfare; Dept of Animal Husbandry, Min. of Agriculture	September 2006	Nil	While toxicity trials of Meloxicam will be completed by April 2006, in any event older cost effective alternatives of proven safety are available.
Direction to Animal Husbandry Depts. Of States/UTs to immediately stop procurement of Diclofenac for veterinary	Dept of Animal Husbandry, Min. of Agriculture	June 2006	Nil	Existing substitutes are cost-effective in relation to Diclofenac. Meloxicam is already approved for veterinary use

use.				and off-patent; hence, is also expected to be cost-effective.
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* As informed by Dept of Animal Husbandry, Min. of Agriculture, some Animal Husbandry Departments viz. Andhra Pradesh, Uttaranchal, West Bengal, Tamil Nadu, Maharashtra, Mizoram, Andaman & Nicobar Islands and Sikkim have issued instructions against procurement of diclofenac for Govt supply.

B. Curbing Leakage of Human Formulations of Diclofenac to the Veterinary Sector

Action	Responsibility	Time Frame	Estimated Cost to Government	Remarks
Ban imports of bulk Diclofenac and Diclofenac formulations. Restrict domestic production of bulk Diclofenac, and formulations containing Diclofenac for human use to 2% of the 2005-06 level for bulk Diclofenac and 5% of formulations,	Ministry of Health & Family Welfare; Ministry of Environment & Forests	September 2006	Nil	Sufficient increase in Cenvat and Central Customs duties to a level sufficient to prevent diversion of human Diclofenac to veterinary use is infeasible in light of Cenvat Policy and relevant WTO provisions. Increased demand for existing

under Sections 10A and 26A of the Drugs and Cosmetics Act.				substitutes can be met by existing capacity; Diclofenac manufacturers will need to shift to older or newer substitutes; Pharma industry has agreed to this course of action.
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In order to effectively implement/enforce the phasing out of veterinary Diclofenac it was felt that the Department of Revenue be requested to impose a 200% ad valorem Customs duty on Diclofenac as well as similar Cenvat duties on domestic production of Diclofenac. Revenue Secretary informed that drug formulations falling under Heading 3303 of Customs Tariff are bound at 40%, while those falling under 3304 are unbound. It may be noted that even this bound rate of 40% would come down still further as a result of the ongoing WTO negotiations under the Doha Work Programme. The unbound rates are likely to be bound as part of this exercise. Secondly, the tariff rate for both headings 3303 and 3304 is 15% and increase in customs duty beyond 15% would require upward revision of tariff rate, which can either be done through a Finance Bill or by using emergency powers provided under the Customs Tariff Act. Theoretically it may be possible to increase custom duty on single active ingredient Diclofenac formulations without any limit, it would not be possible to increase the same for more than one active ingredient diclofenac formulations beyond 40%. Thus even if import duty was raised on single active ingredient diclofenac, importers would bypass this by adding some other minor active ingredient so that the product falls under Heading 3303 of the Customs Tariff. Diclofenac formulations can also be produced domestically, either from imported bulk drug or bulk drug produced domestically. Thus, it would not suffice if customs duty is increased only on the

formulations, since the bulk drug can also be imported. Diclofenac bulk drug falls under heading 2942 and at present attracts customs duty of 15%. The WTO bound rate for bulk drugs falling under 2942 is 40%. Thus, here also theoretically the customs duty can only be increased to maximum 40%. The bulk drug diclofenac can also be made domestically from more basic raw materials, which do not attract customs duty of more than 15% and it may not be possible to increase customs duty on all these raw materials. Thus, if diclofenac bulk drug is manufactured domestically, upward revision of customs duty on this product to any limit would not have any bearing on its domestic prices. As regards excise duty, the policy of the Government is that all manufactured items should attract excise duty at the mean Cenvat rate of 16%, it may not be desirable to increase excise duty on a specific formulation. Hence it was suggested by the Department of Revenue that since increase in customs duty may not be an effective option to achieve substantial increase in domestic prices of Diclofenac formulations, the only solution would lie in banning diclofenac formulations altogether, or imposing quantitative restriction thereon, both for human and veterinary use, provided that Ministry of Health & Family Welfare agree. In addition a ban on imports could be put in place. Such measures would not be WTO-inconsistent, as Article XX of GATT provides a carve-out for measures “necessary to protect human, animal or plant life or health”.

C. Monitoring Conservation and Recovery of Existing Vulture Sites:

Action	Responsibility	Time Frame	Estimated Cost to Government	Remarks
Set up multi agency, multi disciplinary National Vulture Conservation Advisory and Steering	Ministry of Environment & Forests	Informal set-up exists, to be formalized by September 2006	ca. Rs 5.00 lakhs per year for travel and honorarium of members from existing budgetary provisions	

Committee for monitoring status of vulture populations and working out future priorities and strategies				
Set up Technical Advisory Committees to monitor status of vulture populations and work out viable conservation strategies; to report to National Steering and Advisory Committees	Chief Wildlife Wardens of Range States/UTs	Ongoing – completion September 2006	Ca. Rs 3 lakhs per year per State for travel costs and honorarium to members	Technical Advisory Committees to be multi agency, multi disciplinary bodies
Conduct population surveys and review periodically till self sustaining populations are established	Chief Wildlife Wardens of Range States/UTs	On-going; to continue	ca. Rs 10 lakhs per year per range State from existing budgetary resources	In due course, surveys to be integrated into national wildlife population estimations for key engendered species
Collation of data on vulture species populations	State Technical Advisory Committees and National Vulture Conservation Advisory and Steering Committee;			

	Ministry of Environment & Forests			
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1. All States have been advised to set up State level Committees to continuously monitor the vulture population and conservation efforts. These State level committees would periodically report to the National Level Vulture Conservation Advisory and Steering Committee. A set up exists informally, but it is proposed to set up a formal multi agency national committee with a mandate for working out strategies for vulture conservation by identifying priority areas for focus for the future.

2. Conduct population surveys (nesting, recruitment, survival) and review them periodically till self sustaining populations are established. All Chief Wildlife Wardens have been directed to carry out systematic and continuous evaluation of the population of the status of vultures in their States. Some of the States where surveys have already been conducted include Assam, West Bengal, Madhya Pradesh, Himachal Pradesh, Gujarat, Rajasthan, Uttaranchal and Uttar Pradesh. National level surveys have been carried out by BNHS. The MoEF in collaboration with GEER Foundation, Gujarat is to take up a project for survey of the vulture population in Gujarat.

3. The population estimation studies together with studies on the ranging patterns, foraging movements and identification and protection of the existing colonies of the three species of vultures to ensure breeding success in the wild that are being conducted by the State governments have to be collated on a periodic basis.

D. Setting up and Expansion of Vulture Care and Breeding Centres:

Action	Responsibility	Time Frame	Estimated Cost to Government	Remarks
Establish 4 new vulture breeding centres in the zoos at Junagadh, Bhopal, Hyderabad and Bhubaneswar.	CWLW Gujarat, Madhya Pradesh, Andhra Pradesh, and Orissa	March 2009	Rs 100 lakhs to be provided by Central Zoo Authority in 2006-07, on receipt and review of the proposals from the State Govts.	Technical assistance may be obtained from Central Zoo Authority, Wildlife Institute of India, and BNHS
Expansion of existing vulture breeding centres at Pinjore and Buxa	CWLW Haryana and West Bengal	March 2009	As per requirement by the respective State Govts.	

E. Control of further mortality:

Action	Responsibility	Time Frame	Estimated Cost to Government	Remarks
Safe disposal of Diclofenac contaminated carcasses	State Animal Husbandry Departments; concerned Panchayats/ Municipalities	Immediate, to continue for 1 year after complete phase out of veterinary Diclofenac	May be borne from the budgetary allocations of the Ministry of Rural Development. More and more carcasses are being used for raw material for various	Necessary to prevent further mortality of vultures

			industrial uses. Hence a rough projection puts about 15 lakhs carcasses being disposed in the country side. ca Rs 400/ pit would have to be spent for burying each carcass.	
Record mortalities and send carcasses for autopsies and diagnostic tests in the vulture care and diagnostic centres	CWLWs of Range States/ Uts	Immediate, to continue for 1 year after complete phase out of veterinary Diclofenac	ca. Rs 2 lakhs per year countrywide	
Conduct research on other possible threats to vultures conservation	Wildlife Institute of India, SACON, BNHS	September 2006-August 2009	ca. Rs 1 crore for research support	Other threats may include other chemical contaminants, habitat modification, impacts of infrastructure, etc.

F. Raising Awareness especially among Users of Veterinary Formulations:

Action	Responsibility	Time Frame	Estimated Cost to Government	Remarks
Publicity campaigns in	Ministry of Environment &	Ongoing – to be	ca. Rs 100 lakhs per	Without awareness

all relevant media, targeting users of veterinary formulations, policymakers, school students, and the general public, on ecological significance of vultures, and their responsibilities for vulture conservation (phase out of Diclofenac, safe disposal of Diclofenac treated livestock carcasses)	Forests; Dept. of Animal Husbandry; Ministry of Information and Broadcasting; Ministry of Education; State/UTs Depts. of Publicity; concerned NGOs	mainstreamed in the respective Environmental Awareness and Education Programmes	year across all Government agencies from existing publicity budgets	among stakeholders, conservation efforts are unlikely to succeed.
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It is imperative to have an awareness campaign on importance of vultures in the ecological cycle. Conservation efforts would be incomplete without the participation of local people. The same has also been envisaged 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 campaign should also have demonstration and education on safe means of disposal of carcasses.

MoEF sponsored a film “*The Last Flight*” for telecast, besides radio and TV spots, for raising awareness on vulture conservation. States have been requested to develop education and awareness materials keeping the Animal Husbandry

sectors and farmers in mind. BNHS, GEER Foundation and other organizations have produced extension materials. The media is also proactive in publicizing the problem of vulture decline and its causes.

G. Monitoring Implementation of Action Plan:

A Plan is only as good as its implementation. The Ministry of Environment & Forests at the level of Secretary or Director-General Forests and Special Secretary will conduct six monthly reviews of the implementation of the Action Plan by all concerned agencies at the Central and State levels. Quarterly progress reports will be submitted by each of the concerned agencies to the Director, Wildlife Preservation and Additional Director-General of Forests, by each of the agencies involved in the Action Plan.

The purpose of the reviews will be to ensure that all concerned agencies adhere to their respective time frames in respect of the actions to be taken by each under the Action Plan; remove bottlenecks to implementation; and propose amendments to the Action Plan, as may be necessary in light of experience, for consideration at higher levels.

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Acronyms Used

BNHS	Bombay Natural History Society
CWLW	Chief Wildlife Warden
D & C Act	Drugs and Cosmetics Act, 1940, India
E&F	Environment and Forests
GATT	General Agreement on Tariffs and Trade
GEER	Gujarat Ecological and Education Research Foundation, Gandhinagar
IUCN	International Union for Conservation of Nature
IVRI	Indian Veterinary Research Institute, Bareilly
MoEF	Ministry of Environment and Forests
NGO	Non Governmental Organisations
NSAID	Non Steroidal Anti Inflammatory Drugs

RSBP	Royal Society for Protection of Birds, UK
SACON	Sálim Ali Centre for Ornithology and Natural History, Coimbatore
USFWS	United States Fish and Wildlife Service
WII	Wildlife Institute of India, Dehradun
WTO	World Trade Organisation