

A Blueprint for the Recovery of Asia's Globally Threatened Vultures



February 2021

(with new actions highlighted)

The Current State of South Asia's Vultures

Twenty years ago there were tens of millions of vultures in the Indian subcontinent. They provided a valuable ecosystem service by disposing of millions of tonnes of waste carrion from dead cattle each year. Now they, and the services they provided, are nearly all gone. Three species of *Gyps* vultures endemic to South and Southeast Asia, white-rumped vulture (*Gyps bengalensis*), long-billed vulture (*G. indicus*) and slender-billed vulture (*G. tenuirostris*), are the worst affected, but red-headed vulture (*Sarcogyps calvus*) is listed by IUCN as Critically Endangered and Egyptian vulture (*Neophron percnopterus*) is Endangered. All five species are threatened with global extinction after rapid population declines, which began in the mid-1990s. The white-rumped vulture population in India in 2007 was estimated at one-thousandth of its level in the early 1990s.

Veterinary use of the non-steroidal anti-inflammatory drug (NSAID) diclofenac is the major cause of the declines in *Gyps* vulture populations. Diclofenac has been used to treat symptoms of disease and injury in domesticated ungulates in many parts of the Indian subcontinent since the 1990s. The effects of diclofenac have been studied experimentally on captive individuals of three of the global total of eight *Gyps* vulture species. In all the species tested, death occurred within a few days of treatment with a single low dose of diclofenac, associated with severe kidney damage. Extensive visceral gout (accumulation in tissues of the excretory product uric acid) and necrosis of kidney tissues were observed at post-mortem. The kidneys of vultures that died in these experiments showed similar pathology to that found in the majority of vulture carcasses collected from the wild since the declines began. A large-scale survey of the amount of diclofenac in liver tissue from carcasses of domesticated ungulates available as food to vultures in India in 2004 – 2005 showed that the prevalence and concentration of the drug at that time was more than sufficient to cause the observed rapid population declines which were occurring then.

Veterinary use of diclofenac was banned in India, Pakistan and Nepal in 2006, in Bangladesh in 2010 and in Cambodia in 2019. Use of diclofenac has declined markedly since then in some areas but has changed very little in others. Diclofenac has partly been replaced in veterinary use by the vulture-safe NSAID meloxicam. In India, the prevalence of diclofenac in cattle carcasses has declined most in areas where the prevalence of meloxicam has increased most, indicating a beneficial switch in some regions. However, some other NSAIDs which have replaced diclofenac in veterinary practice in the region have been shown to be toxic to vultures.

There are important differences between Southeast Asia and the Indian subcontinent in the problems faced by vulture populations. Cambodia still supports small but stable remnant populations of white-rumped vulture, slender-billed vulture and red-headed vulture (*Sarcogyps calvus*), numbering hundreds of individuals in total. Diclofenac has been less widely used for veterinary purposes in the Southeast Asian countries where surveys have been conducted, including Cambodia and Myanmar. Most recorded vulture deaths in Cambodia are attributed to accidental poisoning when poison bait, which is usually a pesticide, is placed with the intention of killing other species. Hunters use poisoned bait to catch and kill quarry species such as waterbirds and poisoned bait is also used to kill problem dogs and wild carnivores which threaten livestock and also to kill problem cattle. This activity is illegal, but enforcement to prevent it is difficult. Cambodia's vultures are also thought to be chronically food limited. Populations of wild ungulates on whose carcasses they previously relied upon have undergone severe declines. The free-ranging herds of domestic bovids that replaced them are now also declining, as a result of the mechanisation of agriculture. Infrastructure development and illegal logging are increasingly bringing people into remote areas where vultures remain.

Conservation Responses

Soon after research had indicated the severity of the effects of diclofenac on vulture populations, the governments of India, Pakistan and Nepal commenced actions to prevent the contamination of vulture food supplies with the drug. India's National Board for Wildlife recommended a ban on veterinary use on 17 March 2005. In May 2006, a directive from the Drug Controller General of India was circulated to relevant officials, requiring the withdrawal of manufacturing licences for veterinary formulations of diclofenac. This directive was further strengthened in 2008, when it was gazetted, and made an imprisonable offence to manufacture, retail or use diclofenac for veterinary purposes. Similar measures were introduced in Pakistan and Nepal at about the same time. Veterinary use of diclofenac was banned in Bangladesh in 2010 and in Cambodia in 2019. Its continued legal use as a medicine for humans has made access to veterinary diclofenac difficult to regulate, especially because some pharmaceutical companies produce vials of diclofenac ostensibly for human use, but containing a quantity of the drug suitable for dosing cattle. The Government of India acted to ban the production of these large vials of diclofenac in 2015.

In 2006, the veterinary NSAID meloxicam was identified by safety-testing research to be safe for vultures. Safety-testing studies in 2020 suggests that another drug, tolfenamic acid, is also sufficiently safe to be provisionally recommended. However, some other NSAIDs which have replaced diclofenac in veterinary practice in the region have been shown by safety-testing studies to be toxic to vultures. These include aceclofenac, which is converted to diclofenac in cattle by their metabolic processes, ketoprofen, nimesulide and flunixin. Scientific evidence has been published in international peer-reviewed journals about the toxicity to vultures of these drugs, but they all remain approved for legal veterinary use in all range states, except for Bangladesh, where veterinary use of ketoprofen has now been banned nationally. Research has shown that replacement of diclofenac with meloxicam has been most effective in Nepal, where a coordinated awareness-raising programme succeeded in reducing the availability of diclofenac in pharmacies to a very low level by 2012. Road transect surveys have shown a marked recover of vulture populations in Nepal since that time.

SAVE

Action to prevent the extinction of *Gyps* vultures in South Asia is coordinated by Saving Asia's Vultures from Extinction (SAVE), a consortium of 24 organisations with established expertise in vulture conservation, which was established in 2011. The national and state governments of the four vulture range states in the Indian subcontinent are engaged in conservation measures through national action plans, and are linking their activities through the Regional Steering Committee for Vulture Conservation (RSC), set up to implement the recommendations of the inter-governmental Declaration on Vulture Conservation within the region in May 2012. For more details of the composition and function of SAVE visit www.save-vultures.org.

Conservation actions undertaken so far, in addition to advocacy for restrictions on diclofenac use, include surveys to measure the effectiveness of the ban on veterinary diclofenac, regular surveys of vultures to measure their population trends, awareness-raising to make the ban more effective, advocacy for enforcement of the ban, contact with the pharmaceutical industry, testing to establish which veterinary drugs are safe and which are harmful to vultures, advocacy with government drug regulatory authorities to ban toxic drugs and improve approval procedures, advocacy with government agriculture departments to reduce state support for the purchase of vulture-toxic but legal veterinary NSAIDs, the creation of Vulture Safe Zones in which intensive campaigns are undertaken to remove toxic NSAIDs from the food supply of the remaining small populations of wild

vultures, and conservation breeding to provide a secure captive population and captive-bred birds for reintroductions.

Vulture conservation measures in Cambodia differ from those employed in the Indian subcontinent because the threats are different, especially in the absence of a significant threat from diclofenac. For Myanmar, where engagement has been more recent, actions are also under review as the threats there are less well understood. Conservation actions taken so far in Cambodia include monthly supplementary feeding at up to four sites in the north and east of the country, nest protection and advocacy against inappropriate use of agricultural chemicals as poisons.

There is Hope for South Asia's Vultures

Conservation actions have achieved substantial success and have resulted in the following major achievements.

1. All vulture range states in the Indian subcontinent, and most recently in Cambodia have banned the veterinary use of diclofenac.
2. In India, the government has banned the production of large vials of diclofenac, ostensibly for human use, to prevent their illegal misuse for the treatment of cattle.
3. In India, monitoring of NSAID residues in cattle carcasses shows that the level of diclofenac contamination of the vulture food supply has fallen substantially. Similar studies are in progress in Bangladesh.
4. Safety testing identified one safe alternative drug, meloxicam, and a second, tolfenamic acid has also recently been identified as being safe. Monitoring of NSAID residues in cattle carcasses shows that meloxicam's use has increased markedly in the region and that diclofenac levels in cattle carcasses declined most where meloxicam increased most.
5. Vulture Safe Zones, which were pioneered in Nepal, are being introduced in other states, and are being expanded, tested and developed. In Nepal, they cover most of the terai regions of the country and have resulted in replacement of diclofenac, mostly by vulture-safe meloxicam. In Bangladesh, Vulture Safe Zones have been given formal gazetted legal status.
6. Population monitoring in Cambodia indicates that the small populations of vultures there are approximately stable or declining slowly.
7. Captive populations of all three of the endangered *Gyps* species have been established and have grown through captive breeding. The captive birds are surviving well and second generation (F2) birds are now also breeding. Releases have been initiated in Nepal and India.
8. In India, regular monitoring of vultures using the repeatable survey method of road transect counts shows that vulture declines have slowed or ceased, whilst in Nepal vulture populations have increased consistently since 2012. Evidence from vulture monitoring in Pakistan and Bangladesh also indicates that the population declines there have slowed or reversed.
9. Efforts to address the threat of poison baits are at an early stage with trial poison response training held recently in Cambodia. This is seen as an initial step for further development in the other range countries.

What remains to be done?

These are all hopeful signs, but the following serious concerns remain:

1. Vulture populations are precariously small and will remain vulnerable to adverse events until numbers have increased substantially. This vulnerable period will be lengthy because the

low natural reproductive capacity and long duration of immaturity of vultures 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 most rapid possible rate of increase, with the population of the species most strongly affected by diclofenac halving every year in India and Pakistan. Even when diclofenac has disappeared, conditions may not permit the maximum possible rate of recovery because of other problems caused by the vulture decline (see points 2 and 3 below) and effects of other NSAIDs (see points 5 - 7 below).

2. In the Indian subcontinent, the disappearance of vultures has led to cattle carcasses being disposed of in ways, such as burial, that may restrict the availability of carrion as food for a recovering vulture population in the future. In Southeast Asia, low populations of wild and domesticated ungulates continue to limit the small vulture populations there.
3. Increases in populations of feral dogs and other predators, caused by enhancement of their carrion food supply in the absence of vultures, may be increasing the frequency of predation of livestock and, as a response, the deliberate placement of poison baits in carcasses to kill the predators. This in turn leads to unintended poisoning of vultures. Large populations of feral dogs and other species of scavengers give rise to other problems, such as an increased risk of dog bites and rabies in humans and other types of disease and public nuisance. Dealing with these problems imposes substantial extra costs on government agencies and charities.
4. Contamination of cattle carcasses with diclofenac has declined, but it has not yet been eliminated. Diclofenac intended for human use is easy to obtain, and easy to misuse for the treatment of livestock. Consequently, carcasses of wild vultures continue to be found with traces of diclofenac in their tissues and post-mortem findings continue to indicate that diclofenac poisoning was the cause of death.
5. The veterinary use of another NSAID (ketoprofen) known to be toxic to *Gyps* vultures is legal and has increased. Published evidence shows that aceclofenac, ketoprofen, nimesulide and flunixin are toxic to vultures, but they remain in legal veterinary use in several key countries. Other NSAIDs are also in legal use which may be harmful to vultures, but have mostly not yet been tested.
6. Aceclofenac, a legally approved NSAID that is metabolised into diclofenac after being administered to cattle, is being used. It is highly likely to kill vultures that feed on contaminated carcasses in exactly the same way that diclofenac does.
7. There is no coordinated, well-established and efficient regulatory mechanism by which legal restrictions are imposed upon veterinary drugs known to cause harm to vultures or on those whose effects have not yet been studied.
8. In some areas, the sparse remaining populations of vultures are threatened by loss or disturbance of nest sites through tree-felling or development.

1) SAVE Board and Committees

AD - Advocacy

Actions Code	Action	Lead Partner (s)	By (end date)
AD2	Achieve the banning of the veterinary use of ketoprofen, aceclofenac, nimesulide, carprofen, and flunixin in India, Pakistan, Bangladesh, Nepal, Bhutan, Cambodia & Myanmar. First step to stop Government purchase or supply of all 5 NSAIDS		
AD2	Discuss the issue with the Regional Steering Committee, all governments and pharmaceutical industry using research results.	SAVE	2021
AD2	Make/update materials available on website specific to these NSAIDs	SAVE RSPB	2021
AD2	Promote action on RSC agenda, highlighting results of latest round of pharmacy surveys	SAVE	2021
AD2	SAVE to promote new India Vulture Action Plan, urgency of safety testing; discuss at RSC	SAVE	2021
AD3/4	Establish system and procedures by which veterinary drugs with unknown effects on vultures have their approval for veterinary use withheld or withdrawn until scientific testing on Gyps vultures establishes their safety at maximum likely exposure levels. (ALL, although lower priority only for Cambodia)		
AD3/4	Provide and update technical assistance and advice on the operation of the procedures, using information from monitoring.	SAVE RSPB	2021
AD3/4	Discuss with NVRCs and at Regional Steering Committee (RSC). Approach medicines regulatory authorities to request that any new veterinary medicine should be tested for safety to vultures prior to registration/release to market. [NB to amend wording here after discussion with drug authority representatives/experts]	SAVE	2021
AD3/4	Refine details and plan of engagement with government mechanism on this in each country using inputs from newly established SAVE Pharma Working Group network	SAVE (FACC)	2021
AD3/4	Explore the possibility of a moratorium on new (veterinary) NSAIDs	SAVE	Tried but not effective
AD5	Work with both the pharmaceutical industry and governments to identify, by a robust safety testing and approval process, NSAIDs that are safe for vultures. Currently meloxicam is the only such drug.		
AD5	Agree on best approach to achieve robust safety testing, and to acknowledge any progress - through relevant national partners.	SAVE TAC	2021

AD5	TAC with IVRI to promote next priority NSAIDs for testing	SAVE TAC BNHS IVRI RSPB	2021
AD5	Complete testing, confirm and promote safety of tolfenamic acid	IVRI	DONE
AD5	Facilitate production of tolfenamic acid report (and publication) and ensure maximum promotion of this	IVRI BNHS RSPB SAVEChair	2021
AD6	Contribute, with government agencies and pharmaceutical companies, to maintaining pharmacovigilance and regulation of veterinary drugs, to prevent their negative effects on wild vultures.		
AD6	Proposed procedure/s to be developed and shared.	SAVE	2021
AD6	Write 'manifesto' regarding how veterinary NSAIDs should be regulated	SAVE FACC Pharma contacts	2021
AD6	Congratulate Indian Govt on National Action Plan commitments and follow up on how this can be achieved across India	Chair	2020
AD7	Establish a SAVE alert web-based system for veterinary drugs which combines information of levels of use from pharmacy surveys and analyses of cattle carcasses with results from safety testing to draw attention of govts to potentially hazardous drugs.		
AD7	Operate system and provide advice to the Regional Steering Committee, governments and pharmaceutical industry	SAVE	2021
AD7	Establish system within SAVE. (System established 2016) Operate system and provide advice to the Regional Steering Committee, governments and pharmaceutical industry.	SAVE TAC	2021
AD7	Add page to SAVE website highlighting NSAIDs of concern and progress in regulating them (include updates on pharmacy surveys). All partners to alert SAVE of any changes & post on website. Review progress annually.	SAVE	Annual
AD7	SAVE: Improve prominence on SAVE website & update information.	SAVE	2021
AD9	Develop wider awareness-raising initiatives to highlight NSAIDs concerns and provide incentives acknowledgement of those taking positive steps.		
AD9	Establish SAVE pharma working group involving initially companies that produce good formulations or showing interest in supporting	SAVE	2021
AD10	Develop SAVE positions on key issues as highlighted by the CMS Vultures MSAP		
AD10	Circulate position statements on key issues, especially NSAIDs (see AD6); also, vulture releases, poison baits, food shortages, collisions, etc. and report at annual meeting [Note Research needs also to be added in research and survey section]	SAVE TAC	2021

AD10	Update CMS annually on SAVE/Blueprint Updates	SAVE	Ongoing
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CB - Captive Breeding

CB1	Conservation breeding of OWBV, LBV and SBV at VCBC Pinjore (India).		
CB2	Conservation breeding of OWBV, LBV and SBV at VCBC Rajabhatkhawa (India).		
CB3	Conservation breeding of OWBV and SBV at VCBC Rani (India).		
CB5	Conservation breeding of OWBV at VCBC Chitwan (Nepal).		
CB8	Conservation breeding of OWBV & LBV at VCBC Bhopal (India)		
CB1,2,3,5,8	Propose optimum vulture numbers to be held at centre for each species	SAVE TAC	2021

RM - Research and Monitoring

RM1	Develop method for GPS PTT vulture tracking and corpse recovery in VSZs.		
RM1	Produce harnessing and wing-tagging guides.	RSPB	DONE
RM1	Provide expert harness-attachment training to all SAVE partners	RSPB/ BNHS	2021
RM1	Monitor, analyse, report on survival/outcome of tagging in each SAVE project (and highlight any refinements)	RSPB BNHS BCN	2021
RM1	Develop alternative tagging method to patagial wing tags, e.g. use of rivetted leg rings	SAVE	2021
RM1	Trial corpse recovery methods using new generation of GPS tags; seek advice from experienced RSPB colleagues	BNHS BCN RSPB	2021
RM10	Estimation of the former and potential future value of the ecosystem services provided by wild vultures.		
RM10	Conduct a survey of costs of cattle carcass disposal, feral dog control and other ecosystem service measurements. Based on IUCN India paper, VSG to have standard statement on role of vultures in disease ecology. Current best knowledge of role of vultures in ecosystem function is inconclusive. Update SAVE website with relevant publications.	SAVE	2021
RM11	Investigate factors affecting use of vulture-safe NSAIDs by veterinarians, paravets and livestock owners.		
RM11	Conduct questionnaire studies, choice experiments and other investigations, as appropriate.	SAVE TAC BNHS	2021
RM11	Exploit potential for collaboration with social scientists who could pursue some of this work. TAC identify means to achieve this, eg SAVE website, engage with pharma groups.	SAVE TAC	2021

FR - Fundraising

FR1	Develop stronger fundraising capacity.		
FR1	Identify national focal points for fundraising. 2. FACC to meet 4 times/year and develop further actions.	SAVE	Done

FR1	Develop sustainable funding approaches for each country/state. Identify broader set of fundraising opportunities (e.g. GEF regional multi-country)	SAVE	2021 Ongoing
FR1	Establish a working group to raise funds for and hold overall responsibility for the Vulture Reserve Fund	SAVE BNHS	2021
FR1	Establish a Vulture Reserve Fund of 5 Crore of unrestricted funds to secure programme	BNHS	2023

2) India

AD - Advocacy

Action Code	Action	Lead Partner(s)	By (end date)
AD1	Achieve the removal from the market of vials of diclofenac supposedly intended for human medicine in excess of 3 ml capacity.		
AD1	Propose restrictions on large vials to the Regional Steering Committee, National Vulture Recovery Committees (NVRCs), governments and pharmaceutical industry. Establish the restrictions.	BNHS	Done
AD1	Proactive involvement (including providing technical assistance) in court case brought by Indian pharma company to uphold 2015 ban.	Arulagam	Done
AD1	Approach appropriate agency/ies accredited /recognised by concerned governments to undertake pharmacy surveys and produce reports related to the multi-dose vial issue		Not feasible Dropped
AD1	Monitor availability of larger (>3ml) diclofenac vials	BNHS, Associates, State Govts.	2021
AD2	Achieve the banning of the veterinary use of ketoprofen, aceclofenac, nimesulide, carprofen, and flunixin in India, Pakistan, Bangladesh, Nepal, Bhutan, Cambodia & Myanmar. First step to stop Government purchase or supply of all 5 NSAIDS		
AD2	Seek bans for all 5 drugs for veterinary use – follow-up on process already initiated.	SAVE, BNHS IVRI	2021
AD2	Approach State Drug Controller/Animal Husbandry Director to stop Govt. supplies to vets and prohibits use by Govt vets. (refer to 2012 Delhi Declaration) – at least all VSZ initiatives to do this	SAVE, BNHS Arulagam Corbet Fndn Neohuman Fndn	2021
AD2	Chase aceclofenac ban in 2021	BNHS, SAVE	2021
AD2	Formally approach Drug Controller Gen (India) through IVRI. Request IVRI to provide technical input for joint recommendation with BNHS to prompt an advisory from DCGI on this as interim measure	SAVE, BNHS IVRI	2021

AD2	Provide technical assistance and advice on the operation of the ban, using information from monitoring.	SAVE RSPB	2021
AD2	State level advocacy targeting Govt authorities including all state/provincial Animal Husbandry Depts to stop purchase target NSAIDs for vets	BNHS	2021
AD3/4	Establish system and procedures by which veterinary drugs with unknown effects on vultures have their approval for veterinary use withheld or withdrawn until scientific testing on Gyps vultures establishes their safety at maximum likely exposure levels. (ALL, although lower priority only for Cambodia)		
AD3/4	Explore the possibility of a moratorium on new (veterinary) NSAIDs	BNHS	Tried but dropped
AD3/4	Additional actions needed here? Seek greater engagement from National VRC?		
AD5	Work with both the pharmaceutical industry and governments to identify, by a robust safety testing and approval process, NSAIDs that are safe for vultures. Currently meloxicam is the only such drug.		
AD5	Promote funding of IVRI safety testing and discuss revision of the list of drugs to be tested. Provide encouragement and technical advice.	SAVE BNHS RSPB IVRI	2021
AD6	Contribute, with government agencies and pharmaceutical companies, to maintaining pharmacovigilance and regulation of veterinary drugs, to prevent their negative effects on wild vultures.		
AD6	Initiate discussions with Regional Steering Committee, national committees, governments and pharmaceutical industry. Establish procedures.	BNHS	2021
AD8	Improve the availability of more effective vulture-safe drugs and formulations thereby facilitating take up by veterinary practitioners.		
AD8	Contact and sensitisation of pharma industry (approach major companies for support). Sensitise drug regulation authorities to take appropriate steps to favour production of well formulated veterinary meloxicam. Share and publicise good practice examples among SAVE and more widely for companies (e.g. Bangladesh) able to demonstrate better (e.g. neutral pH etc) meloxicam formulations and alert Govts to this aspect. Sensitise more companies on this.	BNHS SAVE Arulagam (Tamil Nadu)	2021
AD8	Request Director of IVRI to recommend Tolfenamic Acid to MoEFCC and Veterinary Council of India. Publicise results of main report on tolfenamic acid (available on MoEFCC website/SAVE dossier). Check on Tolfenamic acid formulations that they are being used and accepted by vet community all countries	SAVE BNHS	2021
AD9	Develop wider awareness-raising initiatives to highlight NSAIDs concerns and provide incentives acknowledgement of those taking positive steps.		
AD9	Initiate system to support eg cattle shelters & dairy cooperatives that ensure only vulture-safe NSAIDs are used. (eg kite-mark/certification system).	Arulagam SAVE Associates	2021

AD9	General national awareness programme perhaps using a celebrity as a front person	BNHS SAVE Associates	2021
AD9	Dialogue with drug companies identified producing good formulations (meloxicam, tolfenamic acid)	BNHS SAVE	2021

CB - Conservation Breeding

CB1	Conservation breeding of OWBV, LBV and SBV at VCBC Pinjore (India).		
CB1	Maintain the captive population in good health. Produce as many fledglings as possible of all three species, using artificial intervention as appropriate, but with less emphasis on OWBV and more on SBV and LBV, using artificial incubation for those species if appropriate. Transfer of surplus immatures to release programme.	BNHS	2025
CB1	No enhancement of breeding WRV and IV, but full effort to breed more SBV	BNHS	2021
CB2	Conservation breeding of OWBV, LBV and SBV at VCBC Rajabhatkhawa (India).		
CB2	Maintain the captive population in good health. Produce as many fledglings as possible of all three species (subject to sufficient aviary space). There should be special emphasis on SBV, using artificial incubation for that species if appropriate. Transfer of surplus immatures to release programme.	BNHS	2025
CB2	No enhancement of breeding WRV and IV, but full effort to breed more SBV	BNHS	2021
CB3	Conservation breeding of OWBV and SBV at VCBC Rani (India).		
CB3	Maintain the captive population in good health. Produce as many fledglings as possible of both species (subject to sufficient aviary space). There should be special emphasis on SBV, using artificial incubation for that species if appropriate. Transfer of surplus immatures to release programme.	BNHS	2025
CB3	No enhancement of breeding WRV and IV, but full effort to breed more SBV	BNHS	2021
CB3	Complete second and add third colony aviary in Assam centre	BNHS	2021
CB6	Conservation breeding of OWBV and LBV at CZA centres (India).		
CB6	Training of staff and preparation of facilities Transfer of captive bred OWBV and LBV from VCBC Pinjore.	BNHS	2021
CB6	Maintain the captive population in good health. Produce as many fledglings as possible by natural methods.	MOEFCC CZA / State Zoos	2025
CB6	Transfer captive-bred birds to release facility or other centres.	CZA / BNHS	2025
CB6	Update release plan annually.	CZA	2025
CB8	Conservation breeding of OWBV & LBV at VCBC Bhopal (India)		
CB8	Establish & maintain a captive population in good health – primarily through supply and exchanges of subadult birds from other existing centres.	BNHS / State forest departme nts	2021

VS - Vulture Safe Zone – Implementation

VS1	Identification and selection of new provisional Vulture Safe Zones (pVSZs) in India, in particular for LBV.		
VS1	Collect information and select pVSZs. Completed	BNHS	Done
VS2	Capacity building & local advocacy of prov. Vulture Safe Zones (pVSZs) India.		
VS2	Develop capacity in pVSZs.	BNHS Neo Human Fndn Arulagam	2021
VS3	Selection of pVSZs in India suitable for conversion to full VSZs.		
VS3	Selection and conversion of pVSZs to full VSZs based upon undercover pharmacy monitoring data and monitoring of fates of tagged vultures. Focus on proposed release areas & transboundary areas VSZs and review current emphasis (prioritise Haryana, UP, Bihar, Gujarat, Tripura, Meghalaya, W Bengal, Jharkhand)	BNHS NeoHumanFndn Arulagam SAVE	2022
VS3	Review selection/process & then again review in 2019, 2021. (2017 MP Reviewed)	BNHS SAVE	2021
VS4	Maintenance and review of VSZs in India		
VS4	Continue VSZ implementation. Potential removal of VSZ status if monitoring shows that conditions have changed.	BNHS SAVE TAC	2021
VS5	Release of captive-bred vultures in VSZs in India.		
VS5	Identify suitable Release Zones and prepare Vulture Release Plan for each	BNHS	2021
VS5	Assessment of Release Zone through undercover pharmacy surveys and cattle carcass sampling before transfer of birds to release aviaries	BNHS	2021 Annual
VS5	Transfers of captive-bred vultures to holding aviaries in VSZs.	BNHS, Indian State Govts	2021
VS5	Releases of first captive-bred vultures in VRZs.	BNHS, Ind State Govts	2021
VS20	Livestock management and husbandry training in pVSZs and VSZs in Tamil Nadu		
VS20	Implement training programme.	Arulagam	2022

ZM - Vulture Safe Zone – Monitoring

ZM1	Monitoring movements, survival and causes of death of wild vultures with GPS PTTs in pVSZs and Release Zones. Aim should be the tagging of at least 30 individuals of each species, for instance WRV in Pinjore, IV in Madhya Pradesh and SBV in Assam.		
ZM1	Seek permits for capture and tagging of wild WRV, IV and SBV in VSZs and Release Zones. Initial tagging trials & monitoring/recovery system in place for any mortalities for autopsy.	BNHS Nat Vult RC	2021

ZM2	Monitoring of survival and causes of death of released vultures with GPS PTTs in pVSZs and VSZs.		
ZM2	Tag all captive-reared and captive-bred vultures prior to release with GPS tags. Monitor to identify foraging sites, recover corpses and establish cause of death.	BNHS	2021
ZM4	Monitoring of availability of NSAIDs for veterinary use in representative samples of pharmacies and other outlets in pVSZs and VSZs.		
ZM4	Conduct undercover surveys of outlets for veterinary drugs. Record NSAIDs offered for use for veterinary purposes. Identify the provenance and vial size of diclofenac and date of manufacture offered for veterinary use.	BNHS Arulagam NeoHuman Fndn	2021
ZM4	Assessment of Release Zone through undercover pharmacy surveys and cattle carcass sampling before transfer of birds to release aviaries	BNHS	2021 Annual
ZM5	Monitoring of wild vulture populations and breeding success in pVSZs and VSZs in India, Pakistan, Bangladesh, Nepal, Myanmar & Cambodia.		
ZM5	Conduct surveys over representative areas of the zone, including nest counts and/or road transect surveys, as appropriate.	BNHS Arulagam NeoHuman Fndn Corbett Fndn	2021

RM - Research and Monitoring

RM1	Develop method for GPS PTT vulture tracking and corpse recovery in VSZs.		
RM1	Complete tagging and recovery tests on RHV and LBV. Evaluate corpse recovery using simulated tagged corpses. Test tag attachment methods on captive Gyps.	RSPB BNHS	Done
RM1	Begin tag deployment on Gyps vultures in pVSZs and VSZs.	RSPB BNHS	Done
RM2	Road transect surveys of vulture numbers in India. (NB South India isn't included here. Needs action to follow-up)		
RM2	Conduct surveys using same methods as in previous surveys. Publish results of the survey done in the previous year.	BNHS RSPB	Every 2 years: March 2021
RM2	Extend surveys to include South India	tbc	2021
RM5	Monitoring of NSAID contamination of ungulate carcasses in northern India and Nepal.		
RM5	Complete current round of sample collection in several states. Measure concentrations of all NSAIDs potentially hazardous to vultures.	BNHS IVRI	2021
RM5	Publish NSAID monitoring results and expected effects on vulture death rates	RSPB BNHS	2022

RM6	Monitoring of causes of death and NSAID contamination of wild vultures in India, Pakistan, Nepal, Cambodia & Bangladesh.		
RM6	<p>Create database to document circumstances of death of vultures. Collect as many dead wild and released vultures as possible. Conduct post mortem examinations to determine causes of death. Take liver and kidney samples and determine concentrations of all NSAIDs known to be in veterinary use and pesticides and other poisons. Trial methods to detect NSAIDs and other poisons in bone and other hard tissues. Retain carcasses frozen for future use. Publish the results periodically. 2020 develop methods for acquiring data for database (eg searching at roosts, sniffer dogs?)</p>	<p>SAVE BNHS RSPB</p>	<p>2021 Annually</p>
RM7	Safety testing on captive vultures at Pinjore of NSAIDs of uncertain toxicity. Needs updating from previous discussion		
RM7	Obtain wild Himalayan griffon vultures and house in captivity for safety testing programme.	BNHS	2021 ongoing
RM7	Identification of priority drugs to test	SAVE TAC	2021
RM7	Conduct testing of four NSAIDs. Priority: nimesulide, paracetamol, other (see above). Apply to test four more NSAIDs.	IVRI BNHS	2021 Ongoing
RM7	Review safety testing programme and decide on testing needs.	SAVE TAC	Annually
RM7	Continue testing programme as NSAIDs posing potential hazards are identified by the SAVE alert system (see timeline AD6).	IVRI BNHS	Annually
RM8	Monitoring of availability of NSAIDs for veterinary use in pharmacies and other outlets in India, Nepal, and Bangladesh other than in VSZs.		
RM8	Complete current round of undercover and open pharmacy surveys linked with sampling of ungulate carcasses (see RM5)	BNHS, Arulagam	Annually
RM8	Publish NSAID availability monitoring results.	BNHS RSPB	every 2 years

3) Nepal

AD - Advocacy

Action code	Action	Lead Partner (s)	By (end date)
AD1	Achieve the removal from the market of vials of diclofenac supposedly intended for human medicine in excess of 3 ml capacity.		
AD1	Seek ban	BCN	Done
AD1	Monitor availability of larger (>3ml) diclofenac vials	BCN	Ongoing
AD2	Achieve the banning of the veterinary use of ketoprofen, aceclofenac, nimesulide, carprofen, and flunixin in India, Pakistan, Bangladesh, Nepal, Bhutan, Cambodia & Myanmar - First step to stop Government purchase or supply of all 5 NSAIDS		
AD2	Seek bans of all 5 drugs for veterinary use – follow-up on process already initiated for ketoprofen and aceclofenac. Approach State Drug Controller/Animal Husbandry Director to stop Govt. supplies to vets and prohibits use by Govt vets. (refer to 2012 Delhi Declaration) – at least all VSZ initiatives to do this	BCN	2021
AD2	Provide technical assistance and advice on the operation of the ban, using information from monitoring.	SAVE RSPB	Ongoing
AD3/4	Establish system and procedures by which veterinary drugs with unknown effects on vultures have their approval for veterinary use withheld or withdrawn until scientific testing on Gyps vultures establishes their safety at maximum likely exposure levels. (ALL, although lower priority only for Cambodia)		
AD3/4	Explore the possibility of a moratorium on new (veterinary) NSAIDs	BCN	Ongoing
AD6	Contribute, with government agencies and pharmaceutical companies, to maintaining pharmacovigilance and regulation of veterinary drugs, to prevent their negative effects on wild vultures.		
AD6	Initiate discussions with Regional Steering Committee, national vulture recovery committees, governments and pharmaceutical industry. Establish procedures.	BCN NTNC	2021
AD8	Improve the availability of more effective vulture-safe drugs and formulations thereby facilitating take up by veterinary practitioners		
AD8	Contact and sensitisation of pharma industry (approach major companies for support). Sensitise drug regulation authorities to take appropriate steps to favour production of well formulated veterinary meloxicam.	BCN	Ongoing
AD8	Publicise results of main report on tolfenamic acid (available on MoEFCC website/SAVE dossier)	BCN SAVE	2021
AD8	Check on Tolfenamic acid formulations that they are being used and accepted by vet community all countries	BCN	2021

CB - Conservation Breeding

CB5	Conservation breeding of OWBV at VCBC Chitwan (Nepal).		
CB5	Maintain the captive population in good health. Produce as many fledglings as possible by natural methods. Transfer some captive-reared birds to release facility along with chicks of previous year.	NTNC	2023
CB5	Update the release plan (ongoing) in consultation with national partners, with plans to release captive-bred birds when less than 2 years old, maintaining best breeding birds but releasing others. All this subject to ongoing safety-evaluation of the environment and annual review. Continue with above for new release plan (5 year plan).	DNPWC BCN NTNC	2021

VS - Vulture Safe Zones - Implementation

VS6	Maintenance and review of VSZs in Nepal.		
VS6	Continue VSZ implementation and expansion	NNVRC, BCN	2021
VS7	Release of captive-reared & captive-bred vultures in VSZs in Nepal.		
VS7	Releases of captive-reared OWBV not likely to breed from VCBC.	NNVRC, BCN, NTNC	Done
VS7	1-2 Releases of captive-bred OWBVs each year. Numbers released subject to annual review, taking release success & numbers of birds bred into account. See more info in Additional Reports.	NNVRC, BCN, NTNC	2023
VS13	Community-led vulture-based tourism in pVSZs and VSZs in Nepal and Pakistan.		
VS13	Continue to implement programme in Nepal (after ensuring viability and ensuring no disturbance).	BCN	2025

ZM - Vulture Safe Zone - Monitoring

ZM1	Monitoring movements, survival and causes of death of wild vultures with GPS PTTs in pVSZs and VSZs		
ZM1	Seek permits for OWBV capture and tagging of wild vultures in VSZs. Initial tagging trials & monitoring/ recovery system in place for any mortalities for autopsy.	DNPWC BCN	2021
ZM2	Monitoring of survival and causes of death of released vultures with GPS PTTs in pVSZs and VSZs.		
ZM2	Tag all captive-reared and captive-bred vultures prior to release with GPS tags. Monitor to identify foraging sites, recover corpses and establish cause of death.	BCN	2021
ZM2	Plan further releases to 2024. Ongoing.	DNPWC BCN	2023
ZM4	Monitoring of availability of NSAIDs for veterinary use in representative samples of pharmacies and other outlets in pVSZs and VSZs.		
ZM4	Conduct undercover surveys of outlets for veterinary drugs. Record NSAIDs offered for use for veterinary purposes. Identify the provenance and vial size of diclofenac and date of manufacture offered for veterinary use.	BCN	2021

ZM5	Monitoring of wild vulture populations and breeding success in pVSZs and VSZs in India, Pakistan, Bangladesh, Nepal, Myanmar & Cambodia.		
ZM5	Nepal Conduct surveys over representative areas of the zone, including nest counts and/or road transect surveys, as appropriate.	BCN	ongoing

RM - Research and Monitoring

RM1	Develop method for GPS PTT vulture tracking and corpse recovery in VSZs.		
RM1	Complete tagging and recovery tests on RHV and LBV. Evaluate corpse recovery using simulated tagged corpses. Test tag attachment methods on captive Gyps.	RSPB BCN	Done
RM1	Begin tag deployment on Gyps vultures in pVSZs and VSZs.	RSPB BCN	Done
RM3	Road transect surveys of vulture numbers in Nepal.		
RM3	Conduct survey using same methods as in previous surveys. Western lowland surveys annually. Midhills and East-West highway survey every four years (done in 2018)	BCN RSPB	2021
RM5	Monitoring of NSAID contamination of ungulate carcasses in northern India and Nepal.		
RM5	Publish NSAID monitoring results and expected effects on vulture death rates	RSPB BCN	Done
RM6	Monitoring of causes of death and NSAID contamination of wild vultures in India, Pakistan, Nepal, Cambodia & Bangladesh.		
RM6	Nepal Create database to document circumstances of death of vultures. Collect as many dead wild and released vultures as possible. Conduct post mortem examinations to determine causes of death. Take liver and kidney samples and determine concentrations of all NSAIDs known to be in veterinary use and pesticides and other poisons. Trial methods to detect NSAIDs and other poisons in bone and other hard tissues. Retain carcasses frozen for future use. Publish the results periodically. 2020 develop methods for acquiring data for database (eg searching at roosts, sniffer dogs?)	BCN RSPB	2021 Annually
RM8	Monitoring of availability of NSAIDs for veterinary use in pharmacies and other outlets in India, Nepal, and Bangladesh other than in VSZs.		
RM8	Complete current round of undercover and open pharmacy surveys linked with sampling of ungulate carcasses	BCN	Annually
RM8	Publish NSAID availability monitoring results.	BCN RSPB	every 2 years

4) Bangladesh

AD - Advocacy

Action Code	Action	Lead Partner(s)	By (end date)
AD1	Achieve the removal from the market of vials of diclofenac supposedly intended for human medicine in excess of 3 ml capacity.		
AD1	Bangladesh Make contact & take steps to prevent licensing through drug authorities.	IUCN B'desh	Done
AD1	Bangladesh Monitor availability of larger (>3ml) diclofenac vials	IUCN B'desh	2021
AD2	Achieve the banning of the veterinary use of ketoprofen, aceclofenac, nimesulide, carprofen, and flunixin in India, Pakistan, Bangladesh, Nepal, Bhutan, Cambodia & Myanmar - First step to stop Government purchase or supply of all 5 NSAIDS		
AD2	Seek bans for all 5 drugs for veterinary use – follow-up on process already initiated. Enforce ketoprofen/aceclofenac ban within VSZ as first step. Extending bans to whole-country bans is target for ketoprofen/aceclofenac in 2020. <ul style="list-style-type: none"> - Hold meetings with Bangladesh DGDA to reinforce & extend ketoprofen ban to national level by 2020 - Push government to enforce the countrywide ban and ensure the message of the banning has reached all stakeholders including pharma companies and all veterinary offices especially in local levels 	IUCN B'desh	2021
AD2	Provide technical assistance and advice on the operation of the ban, using information from monitoring.	SAVE RSPB	2021
AD3/4	Establish system and procedures by which veterinary drugs with unknown effects on vultures have their approval for veterinary use withheld or withdrawn until scientific testing on Gyps vultures establishes their safety at maximum likely exposure levels.		
AD3/4	Explore the possibility of a moratorium on new (veterinary) NSAIDs	BNVRC	2021
AD6	Contribute, with government agencies and pharmaceutical companies, to maintaining pharmacovigilance and regulation of veterinary drugs, to prevent their negative effects on wild vultures.		
AD6	Initiate discussions with Regional Steering Committee, national committees, governments and pharmaceutical industry. Establish procedures.	IUCN B'desh	2021
AD8	Improve the availability of more effective vulture-safe drugs and formulations thereby facilitating take up by veterinary practitioners		
AD8	Maintain contact and continue sensitisation of pharma industry (approach major companies for support). Reach out to smaller companies. Sensitise drug regulation authorities to take appropriate steps to favour production of well formulated veterinary meloxicam.	IUCN B'desh	2022
AD8	Publicise results of main report on tolfenamic acid (available on MoEFCC website/SAVE dossier)	IUCN B'desh	2021
AD8	Check on Tolfenamic acid formulations that they are being used and accepted by vet community all countries	IUCN B'desh	2021

AD9	Develop wider awareness-raising initiatives to highlight NSAIDs concerns and provide incentives acknowledgement of those taking positive steps.		
AD9	Initiate system to support e.g. cattle shelters & dairy cooperatives that ensure only vulture-safe NSAIDs are used. (e.g. kite-mark/certification system). Dialogue with drug companies identified producing good formulations (meloxicam, tolfenamic acid).	BNVRC	2021
AD9	Develop/promote progress achieved in Bangladesh (labelling) & Tamil Nadu (District ketoprofen bans) initiatives	SAVE SAVE Associates	2022

VS - Vulture Safe Zone - Implementation

VS14.	Identification and selection of pVSZs and VSZs in Bangladesh.		
VS14	Identify and select pVSZs.	BNVRC	Done
VS15.	Implementation of pVSZs in Bangladesh.		
VS15	Continue to implement VSZ programme for two main VSZs.	IUCN B'desh BNVRC	2021

ZM - Vulture Safe Zone - Monitoring

ZM1	Monitoring movements, survival and causes of death of wild vultures with GPS PTTs in pVSZs and VSZs		
ZM1	Seek permits for WRV and HG capture and tagging of wild vultures in VSZs. Initial tagging trials & monitoring/ recovery system in place for any mortalities for autopsy.	BFD IUCN B'desh	2021
ZM4	Monitoring of availability of NSAIDs for veterinary use in representative samples of pharmacies and other outlets in pVSZs and VSZs.		
ZM4	Conduct undercover surveys of outlets for veterinary drugs. Record NSAIDs offered for use for veterinary purposes. Identify the provenance and vial size of diclofenac and date of manufacture offered for veterinary use.	IUCN B'desh	2021
ZM5	Monitoring of wild vulture populations and breeding success in pVSZs and VSZs in India, Pakistan, Bangladesh, Nepal, Myanmar & Cambodia.		
ZM5	Conduct surveys over representative areas of the zone, including nest counts and/or road transect surveys, as appropriate.	IUCN B'desh	2021

RM - Research and Monitoring

RM4	Vulture population monitoring in Pakistan, Bangladesh, Cambodia and Myanmar.		
RM4	Conduct annual surveys following standard procedure.	BNVRC IUCN B'desh BFD	Annually
RM6	Monitoring of causes of death and NSAID contamination of wild vultures in India, Pakistan, Nepal, Cambodia & Bangladesh.		

RM6	<p>Create database to document circumstances of death of vultures.</p> <p>Collect as many dead wild and released vultures as possible.</p> <p>Conduct post mortem examinations to determine causes of death.</p> <p>Take liver and kidney samples and determine concentrations of all NSAIDs known to be in veterinary use and pesticides and other poisons.</p> <p>Trial methods to detect NSAIDs and other poisons in bone and other hard tissues.</p> <p>Retain carcasses frozen for future use.</p> <p>Publish the results periodically.</p>	IUCN B'desh RSPB	Annually
RM8	Monitoring of availability of NSAIDs for veterinary use in pharmacies and other outlets in India, Nepal, and Bangladesh other than in VSZs.		
RM8	Complete current round of undercover and open pharmacy surveys linked with sampling of ungulate carcasses (see RM5)	IUCN B'desh	Annually
RM8	Publish NSAID availability monitoring results.	IUCN B'desh RSPB	every 2 years

5) Pakistan

AD - Advocacy

Action Code	Country	Action	Lead Partner(s)	By (end date)
AD1		Achieve the removal from the market of vials of diclofenac supposedly intended for human medicine in excess of 3 ml capacity.		
AD1		Make contact & take steps to prevent licensing through drug authorities.	WWF Pak SAVE	Done
AD1		Monitor availability of larger (>3ml) diclofenac vials	WWF Pak	Ongoing
AD2		Achieve the banning of the veterinary use of ketoprofen, aceclofenac, nimesulide, carprofen, and flunixin in India, Pakistan, Bangladesh, Nepal, Bhutan, Cambodia & Myanmar - First step to stop Government purchase or supply of all 5 NSAIDS		
AD2		Seek bans for all 5 drugs for veterinary use – follow-up on process already initiated. Maintain ketoprofen and aceclofenac ban within Sindh VSZ as first step. Extend these bans to national bans for ketoprofen and aceclofenac and expand on ban in VSZ to include all 5 drugs. Extend ban to AJK pVSZ	WWF Pak Punjab WPD, AJK FWD	AJK pVSZ ban by end 2021 National ban aim for end 2022
AD2		Provide technical assistance and advice on the operation of the ban, using information from monitoring.	SAVE RSPB PVRP partners	2021
AD3/4		Establish system and procedures by which veterinary drugs with unknown effects on vultures have their approval for veterinary use withheld or withdrawn until scientific testing on Gyps vultures establishes their safety at maximum likely exposure levels. (ALL, although lower priority only for Cambodia)		
AD3/4		Explore the possibility of a moratorium on new (veterinary) NSAIDs	WWF Pak DRAP/MoCC	2021
AD6		Contribute, with government agencies and pharmaceutical companies, to maintaining pharmacovigilance and regulation of veterinary drugs, to prevent their negative effects on wild vultures.		
AD6		Initiate discussions with Regional Steering Committee, national committees, governments and pharmaceutical industry. Establish procedures.	WWF Pak	2021
AD8		Improve the availability of more effective vulture-safe drugs and formulations thereby facilitating take up by veterinary practitioners		
AD8		Contact and sensitisation of pharma industry (approach major companies for support). Sensitise drug regulation authorities to take appropriate steps to favour production of well formulated veterinary meloxicam.	WWF Pak via DRAP	2021
AD8		Publicise results of main report on Tolfenamic acid (available on MoEFCC website/SAVE dossier)	WWF Pak	2021
AD8		Check on Tolfenamic acid formulations that they are being used and accepted by vet community all countries. (Currently not registered in Pakistan. Sensitise and inform DRAP with results from Tolfenamic acid report.)	WWF Pak via DRAP	2021

CB - Conservation Breeding

CB4	Conservation breeding of OWBV at VCC Changa Manga (Pakistan).		
CB4	Maintain the captive population in good health. Produce as many fledglings as possible by natural methods and artificial incubation as necessary. Transfer of birds to release programme as appropriate. Maintain target of 5 to 10 fledglings per year aimed for release.	WWF Pak	2025

VS - Vulture Safe Zone - Implementation

VS8	Identification & selection of additional pVSZ Pakistan.		
VS8	Develop capacity	WWF Pakistan	2021
VS8	Continuing: progress, monitoring and meetings with provincial wildlife department to declare as pVSZ. Identified as AJK. 2020 One more planned (Punjab province)	WWF Pakistan Punjab PWD AJK FWD	2021
VS9	Maintenance & review of VSZs in Pakistan.		
VS9	Continue VSZ implementation and expansion.	WWF Pakistan	2021 Ongoing
VS10	Release of captive-bred vultures in VSZs in Pakistan		
VS10	Releases of captive-bred vultures in VSZs	WWF Pakistan	2024
VS11	Livestock management and husbandry training in pVSZs and VSZs in Pakistan		
VS11	Continue to implement training programme.	WWF Pak Parkar Fndn	2021 /ongoing
VS12	Free veterinary camps in pVSZs and VSZs in Pakistan.		
VS12	Continue to implement programme. [Ongoing] Reinforce links with UVAS in Lahore. Plus use local veterinary capacity (Sindh)	WWF Pak ICI Pakistan, Lahore Uni Vet School	2021/ ongoing
VS13	Community-led vulture-based tourism in pVSZs and VSZs in Nepal and Pakistan.		
VS13	Creating nature clubs at schools. [Rather than tourism, emphasis is on outreach around breeding centre. Progress with nature clubs in VSZ at Nagar Parkar] Ongoing Sindh. Proposed for AJK.	WWF Pak	2021 / ongoing

ZM - Vulture Safe Zone -Monitoring

ZM1	Monitoring movements, survival and causes of death of wild vultures with GPS PTTs in pVSZs and VSZs		
ZM1	Seek permits for WRV capture and tagging of wild vultures in VSZs. Initial tagging trials & monitoring/ recovery system in place for any mortalities for autopsy.	WWF Pak+ provincial WDs	2021

ZM3	Monitoring of movements, survival and causes of death of released vultures with GPS PTTs in pVSZs and VSZs in Pakistan.		
ZM3	Tag all released captive-bred vultures. Monitor to identify foraging sites, recover corpses and establish cause of death.	WWF Pak	2024
ZM4	Monitoring of availability of NSAIDs for veterinary use in representative samples of pharmacies and other outlets in pVSZs and VSZs.		
ZM4	Conduct undercover surveys of outlets for veterinary drugs (prioritise AJK pVSZ then Sindh VSZ). Record NSAIDs offered for use for veterinary purposes. Identify the provenance and vial size of diclofenac and date of manufacture offered for veterinary use.	WWF Pak	2021
ZM5	Monitoring of wild vulture populations and breeding success in pVSZs and VSZs in India, Pakistan, Bangladesh, Nepal, Myanmar & Cambodia.		
ZM5	Maintain surveys over representative areas of the zone, including nest counts and/or road transect surveys, as appropriate.	WWF Pak	2021

RM - Research and Monitoring

RM4	Vulture population monitoring in Pakistan, Bangladesh, Cambodia and Myanmar.		
RM4	National survey planned (funding/personnel required). Maintain annual surveys in specific areas (VSZs) prior to a National survey being achieved.	WWF Pakistan	2021
RM6	Monitoring of causes of death and NSAID contamination of wild vultures in India, Pakistan, Nepal, Cambodia & Bangladesh.		
RM6	Create database to document circumstances of death of vultures. Collect as many dead wild and released vultures as possible. Conduct post mortem examinations to determine causes of death. Take liver and kidney samples and determine concentrations of all NSAIDs known to be in veterinary use and pesticides and other poisons. Trial methods to detect NSAIDs and other poisons in bone and other hard tissues. Retain carcasses frozen for future use. Publish the results periodically.	WWF Pak THC	2021 Annually
RM9	Monitoring of availability of NSAIDs for veterinary use in pharmacies and other outlets in Pakistan.		
RM9	Conduct undercover surveys of outlets for veterinary drugs. Record NSAIDs offered for use for veterinary purposes. Identify the provenance and vial size of diclofenac offered illegally for veterinary use.	WWF Pak HC	2021 / Ongoing

6) Cambodia

AD - Advocacy

Action Code	Action	Lead Partner(s)	By (end date)
AD1	Achieve the removal from the market of vials of diclofenac supposedly intended for human medicine in excess of 3 ml capacity.		
AD1	To achieve Govt. ban of veterinary diclofenac	CVWG	Done
AD1	Follow-up on the ban, enforcement, collect baseline data, monitoring for large vial human diclofenac. Conduct diclofenac and NSAID survey at five provinces around vulture site.	CVWG	2021
AD2	Achieve the banning of the veterinary use of ketoprofen, aceclofenac, Nimesulide, Carprofen, and Flunixin in India, Pakistan, Bangladesh, Nepal, Bhutan, Cambodia & Myanmar - First step to stop Government purchase or supply of all 5 NSAIDS		
AD2	Assess need for removal of 5 target NSAIDs from the market and seek a ban / prevent licensing prior to entry to the market.	CVWG	2022
AD2	Monitor availability and use of target NSAIDs	CVWG	2021
AD3/4	Establish system and procedures by which veterinary drugs with unknown effects on vultures have their approval for veterinary use withheld or withdrawn until scientific testing on Gyps vultures establishes their safety at maximum likely exposure levels. (ALL, although lower priority only for Cambodia)		
AD3/4	Explore the possibility of a moratorium on new (veterinary) NSAIDs	CVWG	2021
AD6	Contribute, with government agencies and pharmaceutical companies, to maintaining pharmacovigilance and regulation of veterinary drugs, to prevent their negative effects on wild vultures.		
AD6	Initiate discussions with Regional Steering Committee, national committees, governments and pharmaceutical industry. Establish procedures.	CVWG	2021
AD8	Improve the availability of more effective vulture-safe drugs and formulations thereby facilitating take up by veterinary practitioners		
AD8	Contact and sensitisation of pharma industry (approach major companies for support). Sensitise drug regulation authorities to take appropriate steps to favour production of well formulated veterinary meloxicam.	CVWG	2022
AD8	Publicise results of main report on Tolfenamic acid (available on MoEFCC website/SAVE dossier)	CVWG	2021
AD8	Check on Tolfenamic acid formulations that they are being used and accepted by vet community (all countries)	CVWG	2021

VS - Vulture Safe Zones - Implementation

VS16.	Identify pVSZs in Cambodia		
VS16	Develop VSZ concept with areas proposed or decide if this approach is not relevant for Cambodia at CVWG meeting(s)	CVWG SAVE	2021
VS17.	Implementation of pVSZs in Cambodia		
VS17	Continue to implement VSZ programme. TAC to support define VSZ criteria for Cambodia	CVWG SAVE(TAC)	2021

ZM - Vulture Safe Zones - Monitoring

ZM1	Monitoring movements, survival and causes of death of wild vultures with GPS PTTs in pVSZs and VSZs		
ZM1	Continue monitoring with tagging as option (with support from TAC).	CVWG SAVE(TAC)	2021
ZM4	Monitoring of availability of NSAIDs for veterinary use in representative samples of pharmacies and other outlets in pVSZs and VSZs.		
ZM4	Conduct undercover surveys of outlets for veterinary drugs. Record NSAIDs offered for use for veterinary purposes. Identify the provenance and vial size of diclofenac and date of manufacture offered for veterinary use.	CVWG	2021
ZM5	Monitoring of wild vulture populations and breeding success in pVSZs and VSZs in India, Pakistan, Bangladesh, Nepal, Myanmar & Cambodia.		
ZM5	Conduct surveys over representative areas of the zone, including nest counts and/or road transect surveys, as appropriate.	CVWG	Annually

RM - Research and Monitoring

RM4	Vulture population monitoring in Pakistan, Bangladesh, Cambodia and Myanmar.		
RM4	Conduct annual census. Quarterly coordinated feeding counts continued.	CVWG	Annually
RM6	Monitoring of causes of death and NSAID contamination of wild vultures in India, Pakistan, Nepal, Cambodia & Bangladesh.		
RM6	<p>Create database to document circumstances of death of vultures.</p> <p>Collect as many dead wild and released vultures as possible.</p> <p>Conduct post mortem examinations to determine causes of death.</p> <p>Take liver and kidney samples and determine concentrations of all NSAIDs known to be in veterinary use and pesticides and other poisons.</p> <p>Trial methods to detect NSAIDs and other poisons in bone and other hard tissues.</p> <p>Retain carcasses frozen for future use.</p> <p>Publish the results periodically.</p>	CVWG	2021 Annually

CAM - Cambodia

CAM1	Monthly supplementary feeding in at least four sites		
CAM1	Provide at least one dead cow per month at vulture restaurants.	CVWG	2021 Ongoing
CAM2	Improve population monitoring		
CAM2	Census vulture restaurants in March, June, September and December.	CVWG	2021 Ongoing
CAM3	Safeguard nesting areas from logging		
CAM3	Check all known nest locations, improve law enforcement at key sites.	CVWG	2021 Ongoing

CAM4	Protect vulture nests from human predation		
CAM4	Evaluate effectiveness of nest protection across sites. Continue nest protection if found to be effective.	CVWG	2021
CAM5	Monitor sales of veterinary drugs at key sites		
CAM5	Quarterly monitoring of veterinary drug sales at key sites.	CVWG	2021
CAM5	Support government focal point on diclofenac ban implementation.	CVWG	2021
CAM6	Increase sustainability of CVWG		
CAM6	Integrate vulture conservation activities into other NGO activities. Develop sustainable financing where possible Evaluate CVWG activities and effectiveness Nationalize management of CVWG	CVWG	2021
CAM7	Assess mortality due to non-NSAID threats		
CAM7	Training workshop on poison baits repeated Learning from other SAVE partners and African countries	CVWG	2021
CAM8	Identify locations of WRV breeding sites		
CAM8	Continued satellite tagging of RHV and WRVs to lead to breeding areas	CVWG	2021

7) Myanmar

AD - Advocacy

Action code	Action	Lead Partner (s)	By (end date)
AD1	Achieve the removal from the market of vials of diclofenac supposedly intended for human medicine in excess of 3 ml capacity.		
AD1	Diclofenac and other NSAIDs toxic drugs for vulture species survey with the under-cover and open questionnaires in Kachin State and Shan State.	MVWG	2021
AD1	Awareness raising on impact of diclofenac in government authorities, veterinary sciences and villagers in Kachin State and Shan State.	MVWG	2022
AD1	Planning on substitution of alternative drugs with the veterinary department.	MVWG	2021
AD1	Survey on mortality of vulture species due to the effect of diclofenac.	MVWG	2022
AD1	Request and propose the restriction on large vials of diclofenac to government with relevant evidences.	MVWG	2024
AD2	Achieve the banning of the veterinary use of ketoprofen, aceclofenac, nimesulide, carprofen, and lunixin in India, Pakistan, Bangladesh, Nepal, Bhutan, Cambodia & Myanmar - First step to stop Government purchase or supply of all 5 NSAIDS		
AD2	Monitor availability and use of target NSAIDs in Kachin State and Shan State.	MVWG	2021
AD2	Request and propose the large vials on target NSAIDs from the market and seek a ban / prior to entry the market in specific areas (Vulture conservation area).	MVWG	2022
AD2	Invite the Livestock and Breeding Department for involvement in diclofenac and other NSAID toxic drugs for vulture species meeting.	MVWG	2022
AD3/4	Establish system and procedures by which veterinary drugs with unknown effects on vultures have their approval for veterinary use withheld or withdrawn until scientific testing on Gyps vultures establishes their safety at maximum likely exposure levels.		
AD3/4	Explore the possibility of a moratorium on new (veterinary) NSAIDs	MVWG	2022
AD6	Contribute, with government agencies and pharmaceutical companies, to maintaining pharmacovigilance and regulation of veterinary drugs, to prevent their negative effects on wild vultures.		
AD6	Initiate discussions with Regional Steering Committee, national committees, governments and pharmaceutical industry. Establish procedures.	MVWG	2022
AD8	Improve the availability of more effective vulture-safe drugs and formulations thereby facilitating take up by veterinary practitioners		
AD8	Contact and sensitisation of pharma industry (approach major companies for support). Sensitise drug regulation authorities to take appropriate steps to favour production of well formulated veterinary meloxicam.	MVWG	2022
AD8	Publicise results of main report on tolfenamic acid (available on MoEFCC website/SAVE dossier)	MVWG	2021

AD8	Check on Tolfenamic acid formulations - that they are being used and accepted by vet community all countries	MVWG	2021
AD9	Develop wider awareness-raising initiatives to highlight NSAIDs concerns and provide incentives acknowledgement of those taking positive steps.		
AD9	Consider initiatives generating awareness with pharmacies, drug distributors, vets, farmers	MVWG	2021

VS - Vulture Safe Zones - Implementation

VS18	Identify pVSZs in Myanmar		
VS18	Collect information and select sites for pVSZs.	MVWG	2021
VS19	Maintenance & review of VSZs in Myanmar		
VS19	Meeting / workshop on information of VSZ designation with the relevant government and representative of ethnic leader.	MVWG	2023
VS19	Continue VSZ implementation and expansion.	MVWG	2023
VS19	Proposal submitted to government for formal nomination of VSZ	MVWG	2023

ZM - Vulture Safe Zones - Monitoring

ZM1	Monitoring movements, survival and causes of death of wild vultures with GPS PTTs in pVSZs and VSZs		
ZM1	Meeting / workshop on Vulture Safe zonation and zone management with the relevant government and representative of ethnic leader.	MVWG	2023
ZM1	Initiate monitoring with tagging as option in longer-term future	MVWG	2023
ZM4	Monitoring of availability of NSAIDs for veterinary use in representative samples of pharmacies and other outlets in pVSZs and VSZs.		
ZM4	Conduct undercover surveys of outlets for veterinary drugs. Record NSAIDs offered for use for veterinary purposes. Identify the provenance and vial size of diclofenac and date of manufacture offered for veterinary use.	MVWG	2022
ZM4	Awareness raising on conservation status of vulture species and impact of diclofenac and other toxic drugs for vulture species in Kachin State.	MVWG	2022
ZM5	Monitoring of wild vulture populations and breeding success in pVSZs and VSZs in India, Pakistan, Bangladesh, Nepal, Myanmar & Cambodia.		
ZM5	Conduct surveys over representative areas of the zone, including nest counts and/or road transect surveys, as appropriate.	MVWG	2022

RM - Research and Monitoring

RM4	Vulture population monitoring in Pakistan, Bangladesh, Cambodia and Myanmar.		
RM4	Establish methodology and ensure baseline surveys carried out.	MVWG	Done
RM4	Comprehensive survey with more survey groups in the 20km ² distance one point to another point in Kachin and Shan State.	MVWG	2022

RM4	Bird ringing and interview survey on vulture sightings at the potential area and other regions (Chin (Naga range), northern Sagaing, Ayeyawaddy (Kachin – kathar), Chin dwin area).	MVWG	2023
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MYA - Myanmar

MYA1	Nesting site protection and law enforcement		
MYA1	Nest site identification and protection.	MVWG	2022
MYA2	Public awareness raising		
MYA2	Work with communities, develop media locally and nationally	MVWG	2021
MYA2	2020 IVAD with Yangon Zoo	MVWG	2022
MYA3	Restaurant site for environmental tourism		
MYA3	Start a restaurant	MVWG	2022
MYA4	Threat assessment		
MYA4	Questionnaires (mainly pharmacy focused), focus group discussion at two sites.	MVWG	2021
MYA5	Update Myanmar vulture species action plan		
MYA5	Plan to be updated and aligned with SAVE blueprint and Vulture MSAP Done	MVWG	Done
MYA6	Regular meetings of MVWG		
MYA6	2 meetings per year	MVWG	Ongoing