

Final Evaluation Report

Your Details	
Full Name	Manigandan Selvaraj
Project Title	Vulture conservation in the Mudumalai- Sathyamangalam region of the Nilgiri Biosphere Reserve, India
Application ID	40816-1
Date of this Report	22-01-2025

1. Indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.

Objective	Not achieved	Partially achieved	Fully achieved	Comments
Pharmacy Market survey				A market survey was conducted involving 90 veterinary pharmacy establishments to assess the availability of Vulture toxic drugs across the three districts of Nilgiris, Coimbatore, and Erode. The survey revealed the presence of the following drugs in the veterinary pharmacies: nimesulide (63.3%) , aceclofenac (2.2%), flunixin (71.1%), and ketoprofen(67.7%).
Pre-workshops survey				A pre-workshop survey was conducted involving 152 pharmacies across three districts within the three target districts. The findings indicated that human and veterinary pharmacies are not distinct entities in the region; rather, both human and veterinary medications are available at the same pharmacy in most cases. Specifically, 38.2% of the pharmacies were classified as human pharmacies, while 61.8% operated as combined human and veterinary pharmacies. Furthermore, 67.8% of pharmacists were aware of the ban on diclofenac and its toxicity to vultures. However, a significant 91.4% of pharmacists were unaware of the potential dangers posed by other harmful drugs, including aceclofenac, nimesulide, ketoprofen, and flunixin, in relation to toxicity for vultures.

Awareness workshops				<p>Following the assessment of the pre-workshops, we collaborated with the Tamil Nadu Forest Department to organize awareness workshops for veterinarians and pharmacists across the three districts. A workshop was held in each district. The initial workshop took place on March 16th, 2024, in the Nilgiris District, with 62 pharmacists and 14 veterinarians in attendance. This was followed by a second workshop on August 20th, 2024, in Coimbatore District, which recorded the participation of 55 pharmacists and 6 veterinarians. Finally, on August 30th, we conducted the last set of awareness workshops in Erode district, with collaboration TamilNadu Forest Department the participation 107 pharmacists and 16 veterinarians. At the conclusion of each workshop, a field visit was organized for each group in coordination with the Forest Department, to observe vultures and their habitats and understand more about the threat to their populations in situ.</p>
Post-workshops survey				<p>Three months following the completion of the awareness workshops, we initiated a post-workshop survey in each of the three districts to gauge the impact of the workshop.. Based on the findings from the pre-workshop survey, 27.6% of pharmacists are aware of NSAIDs. In contrast, the post-workshop survey revealed that 96.7% of pharmacists had become aware of NSAIDs, Vultures, and Their Conservation effects.</p>
1.Survey along streams and Moyar river bank				<p>Due to reasons beyond my control, the permission for research within the tiger reserve was not provided until Septem-</p>

to identify locations of individual trees of tree species favoured by vultures for nesting and roosting and mapping of the same 2. Identifying and mapping nesting and roosting trees (individuals or stand) of WRV in the MTR and STR 3. Measuring variables associated with nesting tree distribution, phenology and regeneration.				<p>ber 2024, when I was asked to concentrate my research only on non-vulture raptors. As this was contrary to my objectives, I decided to withdraw my application for research.</p> <p>As noted in the update from March, in the absence of the necessary permission, I gathered secondary data instead on the roosting and nesting trees used by White-rumped vultures through interviews with local tribal experts, researchers, and birdwatchers. The data includes information over the past decade and has been used to create a map based on the information (attached Annex)</p>
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2. Describe the three most important outcomes of your project.

a). Following the market and pre-workshop survey, we became aware that certain pharmacy owners were unaware of the reasons behind the ban on diclofenac. Additionally, a significant number of pharmacists lack knowledge regarding other harmful drugs, including ketoprofen, nimesulide, aceclofenac, and flunixin, two of which (ketoprofen and aceclofenac) had also been recently banned. Over the past decade, many awareness initiatives have been implemented in this region focused on vulture conservation, including on the ban on diclofenac for veterinary use. However, many pharmacists continue to remain unaware about non-steroidal anti-inflammatory drugs (NSAIDs) that are harmful to vultures and the critical role these birds play in the ecosystem

b). At the end of the awareness workshops conducted by us, majority of the pharmacists informed us that while some of them had heard of the ban on diclofenac, they had no idea why it had been banned. Majority of them had no idea about the role of vultures in our ecosystem, threats to them and the need to conserve them. They were especially appreciative of the field trip where they were able to observe vultures in their habitat and feel like they were contributing to conservation themselves. Our post-workshop survey conducted three months after the awareness sessions indicated that 96.7% of the respondents were now aware about effect of NSAIDs on vultures, about vultures, and their conservation. At the conclusion of our awareness workshops, the pharmacists also pledged not to sell any drug harmful to vultures, including ketoprofen, nimesulide, aceclofenac, and flunixin for veterinary purposes. Additionally, the drug inspectors of the Nilgiris, Erode, and Coimbatore districts instructed also all pharmacists to not sell banned drugs and avoid selling the others that are also harmful for vultures, for veterinary use.

c). Over the past decade, data regarding nesting and roosting patterns of the white-rumped vulture (WRV) indicate that *Terminalia arjuna* is the sole viable nesting tree within the study area. However, the health of this tree species has been deteriorating annually. The *Terminalia arjuna* tree represents the final opportunity for the survival of the white-rumped vulture. I discussed the importance of planting and assisting with the regeneration of these trees within the vulture habitat, with the Tamil Nadu Forest Department. I also raised awareness among the tribal's and local people, through my discussions with them, on the need to conserve and monitor these trees within the region.

3. Explain any unforeseen difficulties that arose during the project and how these were tackled.

Due to unforeseen and uncontrollable reasons, I was denied permission to directly study the nesting and roosting trees of White-rumped vultures in the study area. Despite several attempts and repeated request, endorsement by the local forest department and field directors of the respective Tiger Reserves, the permission was refused. I was told that the department wanted to undertake this study themselves and that they did not want anyone else to do the same. Instead I was asked to focus my studies on non-scavenging raptors. Since this was not my objective or part of my grant proposal, I declined the same. To overcome this hurdle and ensure I completed my objective, I decided to use secondary data obtained from local tribal, community elders, birders and other experts, as well as data from my past research, to develop a map of trees used by WRV and have requested the help of the local communities to monitor and conserve the same.

4. Describe the involvement of local communities and how they have benefitted from the project.

Before the project, most pharmacists in the area had no idea about vultures, vulture conservation and the importance of the ban on veterinary use of diclofenac. Post the project, several pharmacy owners expressed a willingness to volunteer for vulture and wildlife conservation, with some even donating money to carry out awareness workshops and talk among school students in their area. They also started displaying the vulture awareness poster we created especially for them (attached as annexure), in their pharmacies, resulting in more people becoming aware of the problem and about vulture conservation. They even provided certificates and prizes to school students in celebration of International Vulture Awareness Day on September 5, 2024.

The mapping of nesting and roosting sites for the White-rumped Vulture (WRV) was carried out with the help of local tribal communities, who also contributed by joining our team to learn about the identification of vultures and other avian species. The Mudumalai Tiger Reserve, which is bordered by the states of Tamil Nadu, Kerala, and Karnataka, attracts an average of one million visitors annually. As a result, young members of the tribal community who showed interest in our work and helped us on the project are being trained to become tourist guides within the Mudumalai Tiger Reserve.

5. Are there any plans to continue this work?

I am planning to continue our work over the next three to five years, focusing on *Terminalia Arjuna*, which is the last hope for the WRV nesting tree. To achieve this, I have organized a plantation initiative in collaboration with the Tamil Nadu Forest Department, local communities, and government schools. I will cultivate *Terminalia Arjuna* saplings with the involvement of local community members and school students. Subsequently, these saplings will be provided to the Tamil Nadu Forest Department for planting near vulture nesting areas during the non-breeding season. Additionally, I will educate local young tribal individuals on how to identify vultures and other raptors, utilizing local experts for this training. I will also continue to conduct awareness workshops focused on vulture conservation for local pharmacists.

6. How do you plan to share the results of your work with others?

Our findings have already been communicated to the drug control officers in the Nilgiris, Coimbatore, and Erode districts. We intend to present these results to the Chief Wildlife Warden and the Principal Chief Wildlife Warden of the Tamil Nadu Forest Department, as well as the Field Directors of the Mudumalai and Sathyamangalam Tiger Reserves in the next few months. Additionally, we have plans to publish our results in a reputable journal, with all due credits to the Rufford Foundation.

7. Looking ahead, what do you feel are the important next steps?

In the future, it is important to:

- a) Conduct more surveys of nesting and roosting trees and sites of vultures and other raptor species, and threats to their populations in the study area.
- b) Enhance relations with the park authorities to work together to help save the vultures.
- c) Build strong and open relations with local pharmacists and their leadership to develop long-term and sustainable support for vulture conservation.
- d) Strengthening our relationship with the local tribal community and the Tribal Welfare department because we cannot conserve vultures without local community support.

8. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did the Foundation receive any publicity during the course of your work?

Yes, the logo was used in the awareness Poster and Certificate which we produced for Local Pharmacist. The same logo was also placed on the banners at the time of awareness sessions. The logo was also placed on other documents and files related with the project. Pictures of these events are attached here as annexure. The logo will also be placed in all the reports that are shared with the forest department and other stakeholders. We will also be giving credit to the foundation in any publications that arise from the project and share copies of the same with the foundation.

9. Provide a full list of all the members of your team and their role in the project.

Name	Role
Dr. Bindu Raghavan Principal Scientist Centre for wildlife studies, India	Project advisory team, research and outreach expert, designing project, questionnaire format, project activities,, awareness sessions, field trips, production of project publications.
Mr. Byju H Subject Editor of Journal of Threatened Taxa / volunteers	Awareness sessions/lectures
Mr. Sakthivel A Naturalist /Volunteers	Awareness sessions/Lectures
Mr. Muruganantham S Naturalist/Volunteers Coimbatore wildlife conservation Trust	Awareness sessions/lectures
Mr. Subash Subramani Local Tribal/ Field assistant	Population surveys, data collection, awareness lectures and coordination
Mr. Elangovan Ananth Local Tribal/ Field assistant	NSAID surveys, awareness material preparation
Dr. S. Karthik Wildlife Biologist / volunteers Nilgiri North forest Division TamilNadu Forest Department, India	NSAID surveys, awareness material preparation, analysis, mapping
Mr. Vishnu R Local Tribal /Volunteer	NSAID surveys, Secondary data collection about White-rumped vulture nesting and roosting sites
Mr. Ananth A	NSAID surveys, Secondary data collection

Local Tribal /Volunteer	about White-rumped vulture nesting and roosting sites
Mr. Prabhu G Field officer /Birder Mariamma Charitable trust, India	Secondary data collection about White-rumped vulture nesting and roosting sites.

10. Any other comments?

In our study area, research on vultures, birds, and wild animals has predominantly been carried out by non-local researcher. It has long been my aspiration for a local individual to undertake research on vultures in this area. As a local resident myself, I have collaborated with several tribal researchers focused on vultures. However, without the support of the Rufford Small Grant, this initiative would not have been feasible.

ANNEX – 1

Figure1. Map showing of nesting and Roosting site of White-rumped vulture in the Mudumai (MTR) and Sathiyamangalam Tiger Reserves (STR)

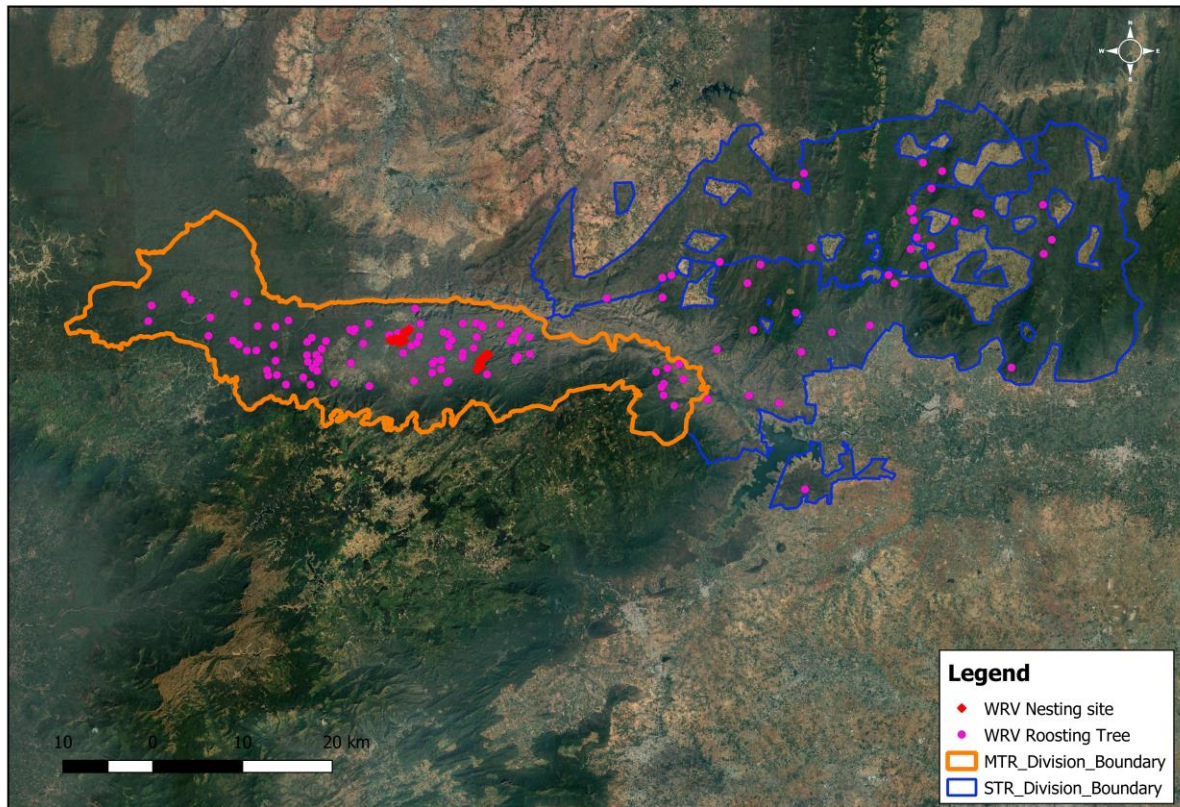


Photo Plate 1. Project activities



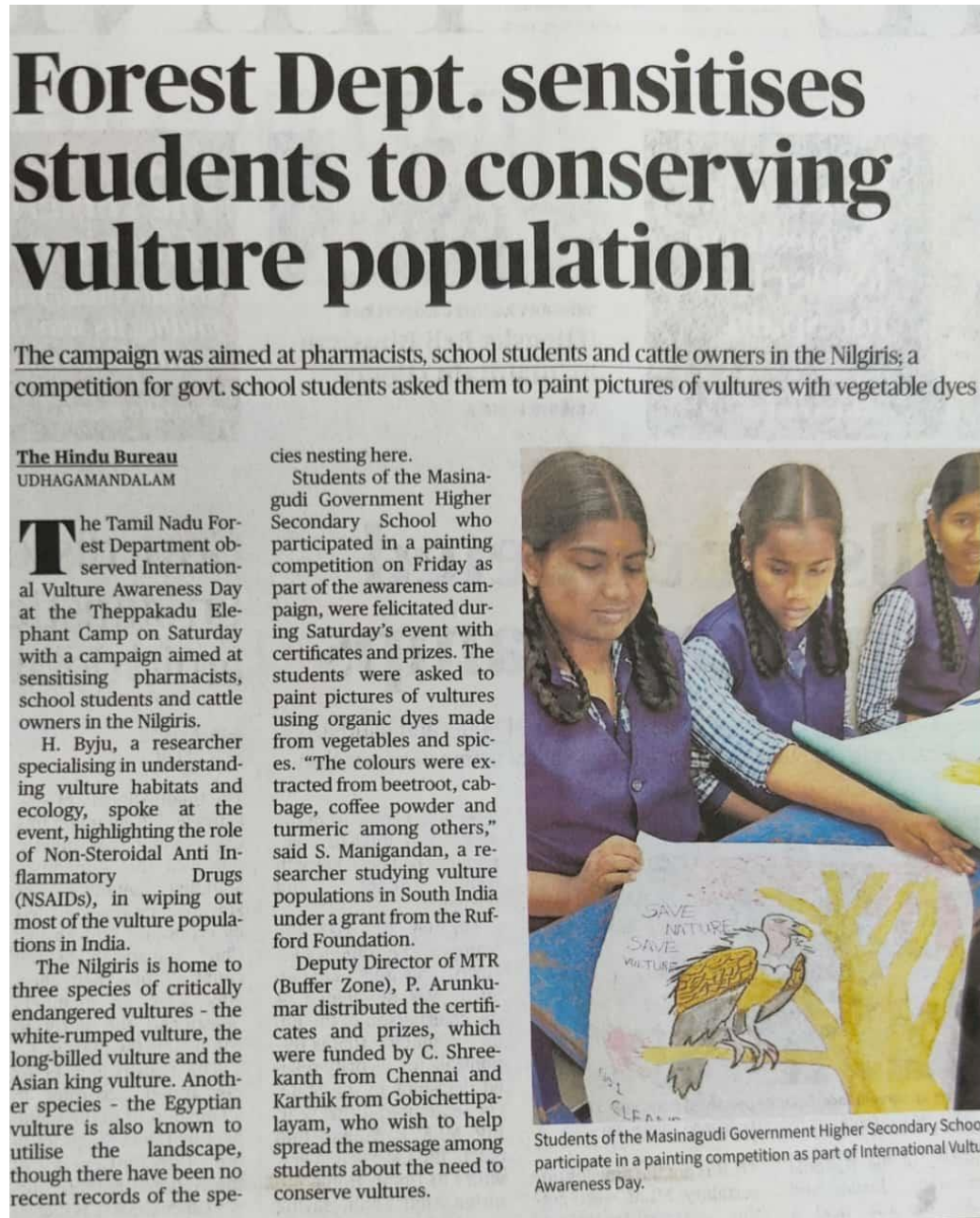
Awareness workshop among the pharmacist and veterinarians





Certificate awarded by Mr. P. Arun Kumar, Deputy Director of MTR, to a participant at IVAD 2024. The prize and certificate are sponsored by Mr. Karthik from Ponmani Medical in Gobichettipalayam.

Photo Plate 2. The News highlights our works



<https://www.thehindu.com/news/cities/Coimbatore/international-vulture-awareness-day-celebrated-in-mudumalai/article68618145.ece>

Awareness programme on vulture conservation today

The Hindu Bureau
ERODE

An awareness workshop on vulture conservation will be held at Bhavanisagar in Sathyamangalam Tiger Reserve (STR) here on Saturday.

A release said a special lecture session would be held in which Manigandan Selvaj, a Rufford project grantee, would speak on vulture conservation at STR while H. Byju, ecologist and author of Valley of Hope, Moyar and Vultures, Wildlife Information Liaison Development (WILD) would speak on Moyar - the valley of Hope for vultures.

T. Sakthivel from Sathyamangalam Environment Wildlife Association would speak on human and animal conflict in STR and S. Sadasivam, wildlife veterinarian of the STR, on Zoonoses and Wildlife: One health approach.

Also, T. Muruganandam from Coimbatore Wildlife Conservation Trust, would speak on human-animal conflict in Coimbatore Forest Division.

In the afternoon, the team will travel to Then-gumarahada for vulture monitoring.

மாலை மலர்



கழுக்குகள் பாதுகாப்பு விழிப்புணர்வு நிகழ்ச்சியில் கலந்து கொண்டவர்களை படத்தில் காணலாம்.

அள்ளி மாயறு தேங்குமரகடா வனப்பகுதியில்

பெருங்கழுக்குகள் பாதுகாப்பு குறித்து விழிப்புணர்வு கூட்டம் உறுதிமொழி ஏற்று கொண்டனர்

புதுளியம்பட்டி, செப். 3-
#ரோடு மாவட்டம்
புதுசெழுவியம்பட்டி அடுத்த
சுழில் குட்டை
கல்லாம்பளையம் அள்ளி
மாயறு தேங்குமரகடா
வனப்பகுதியில் பெருங்கழுக்கு
என்ற பாரு கழுக்குகளை
பாதுகாப்பு குறித்து
விழிப்புணர்வு கூட்டம்
நடந்தது.
இதில் சத்தியமங்கலம்
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யாளர் மணிகண்டன்,
பவானிசாகர் வனச்சரகர்
சதாம் உசேன் கான் ஆகியோர் தலைமையில் சால்நடை

மருத்துவர்கள் மற்றும் மருத்து
கடை உரிமை யாளர்களுக்கு
பெருங்கழுக்கு என்ற பாரு
கழுக்குகளை பாதுகாப்பு
குறித்து விழிப்புணர்வு
ஏற்படுத்தினர்.
இதில் சிறப்பு விருந்தி
னர்களாக மருந்து கட்டு
ப்பாட்டு ஆய்வாளர், நந்த
குமார், மருந்து கடை சங்க
தலைவர் ஸ்ரீதர், முனைவர்கள்
மணிகண்டன், தர்மராஜ்
ஆகியோர் பெருங்கழுக்குகளை
ஏன் பாதுகாக்க வேண்டும்.

அவற்றை பாது காப்பதால்
என்ன பயன் என்பது குறித்து
விளக்கினர்.

அதனைத் தொடர்ந்து
கால்நடை மருத்துவர்கள்
மற்றும் மருந்து கடை
உரிமையாளர்கள், வன
த்துறையினர் உதவியுடன்
தேங்கு மரகடா ஆல்லி
மாயறு வனப்பகுதிக்கு
சென்று பெருங்கழுக்குகளை
பாதுகாப்பதற்கு வனத்துறை
எடுக்கும் நடவடிக்கை மற்றும்
பெருங்கழுக்குகளை எப்படி
இனம் கண்டறிவது என்பதை
முனைவர் மணிகண்டன்
விளக்கினார்.

பின்னர் பெரும் கழுக்கு
களின் கடைசி நம்பிக்கை
என்ற புத்தகத்தை வழங்கி
னர்.

வனத்துறையினர்,
அதிகாரிகள் மற்றும் மருந்து
கடை உரிமையாளர்கள்
பெருங்கழுக்கு என்ற பாரு
கழுக்குகளை வருங்கால
சந்ததிக்காக பாதுகாப்போம்
என்ற உறுதிமொழி ஏற்றினர்.

முதியவர் தூக்கிட்டு தற்கொலை

சென்னிமலை, செப். 3-

சென்னிமலை டவுன், உப்பிலிபாளையம் ரோடு,
காமராஜ் நகர் பகுதியினை சேர்ந்தவர் கஜேந்திரன் (வயது
64). இவர் தனியாகவும், இவரது மனைவி, மகன், மருமகள்
தனியாகவும் அருகே வசித்து வருகின்றனர். கடந்த 2
வருடங்களுக்கு முன்பு ஏற்பட்ட விபத்தில் இடுப்பு எலும்பு
உடைந்து படுக்கை படுக்கையாக இருந்து வருகிறார்.
இதனால் கடுமையான மன உடைச்சலில் இருந்த

Edited and Published by
C.SENTHILKUMAR on behalf
of Malar Publications Ltd, 14,
Nachiappa Street, Erode-638001

Pharmacists from places around vulture habitats educated on dangers of NSAIDs

A notice listing five NSAIDs harmful to vultures – Diclofenac, Aceclofenac, Ketoprofen, Nimesulide and Flunixin – was distributed to around 60 druggists from Mettupalayam, Sirumugai and Karamadai regions of Coimbatore district

Wilson Thomas
COIMBATORE

With surveys showing easy availability of Non-Steroidal Anti-Inflammatory Drugs (NSAID) that are harmful to vultures in places around their habitats, pharmacists from such places have been roped in for the conservation of the winged scavengers.

On Tuesday, pharmacists from Mettupalayam, Sirumugai and Karamadai regions of Coimbatore district were sensitised to the harmful effects of veterinary use of NSAIDs on vultures, as these places lie close to critical vulture habitats in the Mudumalai Tiger Reserve (MTR) in the Nilgiris and Sathyamangalam Tiger Reserve (STR) in Erode.

"Vultures have large ter-



Awareness poster on Non-Steroidal Anti Inflammatory Drugs being pasted in a pharmacy at Mettupalayam in Coimbatore district on Tuesday. SPECIAL ARRANGEMENT

ritory of about 100 km. Resident and migratory population of vultures from MTR and STR could explore bordering places in Coimbatore district. Surveys done in such places in the recent past showed that NSAIDs, including banned ones, were available for veterinary use. Since vultures are scavengers, use of these drugs in cattle could lead to further

decline of their population, as they feed on the carcasses," said vulture researcher and Rufford Foundation grantee S. Manigandan, who organised the meeting of pharmacists.

According to Mr. Manigandan, a notice listing five NSAIDs harmful to vultures – such as Diclofenac, Aceclofenac, Ketoprofen, Nimesulide and Flunixin –

was distributed to druggists to display it in their pharmacies. Veterinary use of Diclofenac was banned in India in 2006 due to its harmful effects on vultures.

"When a survey in pharmacies around vulture habitats were conducted in 2021, Aceclofenac and Ketoprofen were not banned for veterinary use. The ban on their usage as veterinary drug came in 2023. But the two drugs were found available in pharmacies even after the ban," he said.

The MTR - STR belt has resident populations of Red-headed vulture, Long-billed vulture and White-rumped vulture.

Egyptian vulture spotted in the region is believed to be a local migrant. Cinereous vulture, Himalayan griffon vulture and the Eurasian griffon

vulture are winter vagrants.

"As per a 2023 survey, there were 120 White-rumped vultures, followed by Long-billed vulture (7), Red-headed vulture (6) and Egyptian vulture (2). Hence, its highly important to engage all the stakeholders to conserve these vulture species and save them from extinction," said Mr. Manigandan.

Around 60 druggists from Mettupalayam, Sirumugai and Karamadai region attended the sensitisation programme, which was held in association with the pharmacists' association, at Mettupalayam on Tuesday.

Drug inspector M. Nagalakshmi, K. Sakthivel from Sathyamangalam-based organisation SEWA, and T. Muruganandam from the Coimbatore Wildlife Conservation Trust spoke.

<https://www.thehindu.com/news/national/tamil-nadu/pharmacists-from-places-around-vulture-habitats-rope-in-for-conservation-efforts/article68547391.ece>

Campaigns prove effective in phasing out toxic drugs in 'vulture-safe' zones

The Hindu Bureau
UDHAGAMANDALAM

The Tamil Nadu Forest Department continues to work with pharmacists in the key landscapes of Coimbatore, Sathyamangalam in Erode and the Nilgiris to raise awareness about the impacts of Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) on native vulture populations.

The region is home to three resident species of vultures, witnesses a number of occasional migrants, and serves as a last refuge for vultures in Southern India. Vulture researchers in 2024 conducted surveys between January and December of 2024 and learned that due to continued awareness campaigns, 98.7 per cent of the surveyed pharmacists had gained a greater understanding of vultures and



Vultures at the buffer zone of the Mudumalai Tiger Reserve in the Nilgiris. FILE PHOTO

conservation efforts to protect them.

S. Manigandan, a vulture researcher and Rufford Foundation grantee, said that 92 out of 201 pharmacists surveyed during the period were veterinary pharmacists.

It was revealed that the drugs nimesulide, aceclofenac, flunixin and ketoprofen were present at the pharmacies and that 67.8 per cent of the pharmacists were aware of the ban on diclofenac, another

NSAID, but were not aware that diclofenac vials meant for human use were also harmful to vultures.

Following workshops held in the three districts over the year in collaboration with the Forest Department, post-workshop surveys were conducted and results indicate that 98.7 per cent of the pharmacists who took part in the awareness workshops gained a greater understanding of vultures and conservation efforts being

taken to protect them, said Mr. Manigandan.

Recently, the Centre banned the production, sale and distribution of all nimesulide formulations, which has been welcomed by experts working with vulture conservation in the region, including S. Bharathidasan, secretary of Arulagam, a conservation NGO. P. Arunkumar, Deputy Director of MTR (Buffer Zone) said after the awareness programmes, veterinarians in the Nilgiris had largely stopped using nimesulide.

He also added that such awareness campaigns would continue to be held periodically to ensure that drugs that are toxic to vultures would not be sold in the "vulture-safe" zones, encompassing Mudumalai Tiger Reserve, Coimbatore and Sathyamangalam in Erode.

<https://www.thehindu.com/news/cities/Coimbatore/awareness-campaigns-prove-effective-in-phasing-out-toxic-drugs-in-south-indias-vulture-safe-zones/article69064594.ece>

பெருங்கழுக்குகளை பாதுகாப்போம்

1970 களில் பெருங்கழுக்குகள் இந்தியாவில் சுமார் ஒரு கோடிக்கு அதிகமாக இருந்தன. ஆனால் தற்போது ஒரு இலட்சத்துக்கு குறைவாகவே உள்ளது. நீலகிரியில் நான்கு வகையான பெருங்கழுக்குகள் காணப்படுகின்றன, அவற்றில் பெரும்பாலானவை அழியும் தருவாயில் உள்ளன. அவை மிகவும் திறமையான துப்புரவாளர்கள் மற்றும் சுற்றுச்சூழலை ஆரோக்கியமாக வைத்திருப்பதிலும், இறந்த விலங்குகளின் சடலங்களிலிருந்து நோய்கள் பரவுவதைத் தடுப்பதிலும் முக்கிய பங்கு வகிக்கின்றன.



Red-headed Vulture **CR**

Long-billed Vulture **CR**

Egyptian Vulture **EN**

White-rumped Vulture **CR**

Photo credit : Naveen Joyous (RHV), Saurabh Kalia (LBV),
Alexandre Dolgner (EGV) & Sunil Kini (WRV) - eBird

Extinct
EX

Threatened
EW

Lower Risk
CR **EN** **VU** **cd** **nt** **lc**

நமது பெருங்கழுக்குகளை பாதுகாக்க என்ன செய்யவேண்டும்?

கீழ்க்கண்ட மருந்துகளை கால்நடைகளுக்கு வலிநிவாரணியாக பயன்படுத்த கூடாது

1. டைக்குளோபினாக்
2. ஆசிக்குளோபினாக்
3. கீட்டோபுரோபென்
4. நிமிசுலைட்
5. புலுனிக்சின்

பெருங்கழுக்குகளுக்கு நன்மை பயக்கும் கால்நடை மருந்துகள்

1. மெலாக்சிகாம்
2. டோல்ஃபெனாமிக் அமிலம்

Concept : S. Manigandan | Design : K. Mohan Raj | August 2024

Awareness poster for pharmacist



Pharmacist fixed awareness posters in their shops