

Twenty First Annual report

2023 - 2024



அருளகம்
Arulagam

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List of Abbreviations

FRA – Forest Rights Act 2006

HEC – Human Elephant Co-existence

BTR – Bandipur Tiger Reserve

WLS – Wildlife Sanctuary

VSZ- Vulture Safe Zone

STR – Sathyamangalam Tiger Reserve

MTR- Mudumalai Tiger Reserve

Overview

Preamble

Arulagam is delighted to present its intended and implemented project activities for the year 2023-24. Arulagam implemented the need based projects and adopted community driven development approaches towards an integrated development with a sustainable and sound environment. Annual planning meeting convened with the participation of the board of directors, staff team and representatives of the community.

Who We Are

Arulagam is a non-profit organization working to conserve flora and fauna particularly in India and especially in South Asia with people's active participation (through field-based action, research, education, campaign and advocacy efforts).

Our Mission

Conserve nature through active and participatory civic engagement in awareness campaigns, field actions, research, and education.

Our Vision

A society that cares about the environment in order to protect and conserve nature to ensure "sustainable development"

Arulagam project activities contribute to the following United Nations' Sustainable Development Goals :



2024 at a Glance

TOTAL AMOUNT RAISED IN 2023

3,88,06,116

INR

AREA COVERED

105

Villages

28

Taluks

16

Districts

5

States

4

Tiger reserves

4

Sanctuaries

PEOPLE BENEFITTED

2

Families of
nomadic community

800

Tribal families

45

Veterinary doctors

13500

Farmers

34

Livestock keepers

220

Domestic cattle

232

Health workers

20

Students

11

Forest Front line Staff

FLORA & FAUNA CONSERVATION



Critically endangered Vultures
(White rumped Vulture, Long billed Vulture, Red headed
vulture) and Endangered Egyptian Vulture



Hyena



Tarantula
spider



Turtle



Jackal & Fox



Asian
Elephant



Palm civets and
small Indian
civets



105 Endemic
plants

Highlights of the year



Awareness Campaigns: An estimated 16,000 individuals were reached through 64 street theatre events, 40 sensitisation programs, and 4 exhibitions on vultures in targeted villages. 400 key stakeholders, including drug store owners, cattle owners, and veterinary doctors, pledged their support to protect the birds after visiting vulture conservation areas.



Sensitisation: Two drug inspectors, seven veterinary doctors, 22 veterinarians, eight pharmacists, and 54 drug store owners were sensitised on crucial topics related to healthcare and wildlife conservation.



Training of Trainers: A training of trainers program was conducted for 30 conservationists on animal behaviour and effective preventive measures to mitigate wildlife conflicts in Odisha, India.



Cattle Disease Outbreak: Observing Lumpy Skin Disease in cattle in the project area, the team took quick action to prevent a potential outbreak and transmission of the disease to wild ungulates.



Income Generation Program: Two Narikurava families, previously involved in activities harmful to the ecosystem, have become entrepreneurs through the provision of alternative income sources.



Decline of Terminalia Arjuna Trees: There is a decline in Vulture nesting trees (*Terminalia arjuna*) located along riverbanks due to water stagnation around check dams. After reporting the observation to the Forest Department, a study to assess the impact of check dams on the local ecosystem and vulture habitat was initiated.



Vulture Survey: For the second consecutive term, the Forest Departments of Tamil Nadu, Kerala, and Karnataka conducted a synchronised vulture survey to assess vulture population trends. The results were encouraging, revealing a positive upward trajectory.



Capacity Building and Field Methodology: Capacity building and field methodology enhancement training was conducted for field staff, covering topics like data collection and technology, conservation strategies, and regional collaboration.



Farm Fit App: The introduction of the Farm Fit App has helped farmers get better prices for their produce. So far, 13,500 farmers and consumers have registered and benefited from this initiative.



Tuition Centers: Ten tuition centres are operated in tribal villages - Gudalur block, Nilgiris District to ensure education and minimise school dropouts.



Biomedical Waste (BMW)

Training: Arulagam and Toxics Link (Delhi) jointly conducted training in Tamil Nadu for 18 government district training medical officers. 14 cascade trainings were conducted in six districts, covering over 603 health workers and nurses.



Kurunji Nursery: A nursery has been established in Moyar village to supply young, healthy seedlings of various fodder grasses, legumes, and other plants.



Revisiting Indigenous Cattle

Breeds: Farmers learned about the resilience, adaptability, and benefits of breeds like Malnad Gidda, Hallikar, Kankrej, Gir, Ongole, and Tharparkar, including their suitability for natural farming and contributions to soil health through cow dung and urine.



Tribal Welfare: The Tribal Welfare Department of the Government of Tamil Nadu has empaneled Arulagam to implement government-initiated programs in Coimbatore District.



Poonthalir Nursery: Expanded the collection with 14 new native species, now boasting 105 native species and a total of 350,000 saplings.



Training by Poonthalir Nursery

Team: The Poonthalir Nursery team provided training to SHG members from Puliampatti Village, Bhavanisagar, Erode, under the TNRTP project. The 30 participants received practical knowledge on nursery management and seed treatment.



Seed Bank & Seed Exchange

Program: To preserve native genetic diversity, a native seed bank was established to collect and store seeds. A seed exchange program was facilitated to allow farmers to share seeds and support local adaptation.



Farmer Training Programs:

Arulagam and Amritabhoomi jointly organised comprehensive training programs for over 200 farmers, equipping them with knowledge and skills in zero-budget natural farming, soil conservation, and integrated pest management.



Employment at Poonthalir

Nursery: Jobs provided to a differently-abled person, three single women, and nine rural women for seedling production and maintenance.

Recognition



A successful Tamil film actor and philanthropist, Mr. Karthick, identified 25 social welfare icons and honoured each of them with a cash prize of one lakh. Mr. Bharathidasan, the secretary of Arulagam, was honoured as one of the social work icons for his contribution in advocating for and preserving the wildlife ecosystem for the past 20 years.



Global Diversity Foundation, UK, honoured Arulagam's Secretary, Mr. Bharathidasan, as the Community and Conservation Fellow for the year 2023.



The Tribal Welfare Department of the Government of Tamil Nadu has empaneled Arulagam to implement government-initiated programs in Coimbatore District.

Activities undertaken during the project period



A comprehensive cattle survey was conducted in habitations within Vulture Safe Zones (VSZ) in MTR. The vulture team collected cattle-related information such as disease infestation, challenges in cattle rearing, use of medication, ailments and treatments, awareness of vultures, human interaction, and other relevant details. The survey covered 1,358 respondents.



230 traditional livestock owners were educated on the importance of vultures in the ecosystem during the Mullai Thiruvizha at Tirunelveli.



On March 8, 2023, International Women's Day, Ms. Aruna, the District Collector of Nilgiris, unveiled a vulture statue at the Ooty Botanical Garden to raise awareness among tourists. Over 1,200 people visited the statue, and informational displays highlighted the harmful effects of drugs on vultures.



Veterinary health camps were organised in three major hotspots of the Vulture Safe Zone: 1) Alli Maayaru (Nilgiris, Tamil Nadu), 2) H.D. Kote (Mysore, Karnataka and 3) Moyar village (Nilgiris, Tamil Nadu), for the benefit of both cattle and vultures.. The initiative aimed to reduce the use of drugs harmful to vultures and addressed common diseases such as Lumpy Skin Disease (LSD), mastitis, ticks, and common fevers.



Arulagam participated in the synchronised vulture survey conducted to assess vulture population trends in Tamil Nadu, Kerala, and Karnataka. The survey indicated an upward trend in the vulture population, but sustained efforts are crucial to ensure long-term survival. Certain vantage points need to be rescheduled to avoid duplication.



Talks on the significance of vultures was delivered to A) Nilgiris district Eco Club members at Theppakadu, B) Zoology students at PSG Arts and Science College, C) Nature enthusiasts at Kumaraguru College of Technology, D) Newly recruited Forest Rangers, and E) Tirupur. In total, about 430 students, including 184 girls and 246 boys, attended the events.



The Secretary of Arulagam was invited to deliver a keynote speech on 'Message Bearers of Vulture Conservation.' at an event titled 'Glimpses of Vulture Conservation' organised by the Sathyamangalam Tiger Reserve and the Tamil Nadu Innovation Society at Gobi Arts and Science College, Erode, on February 27, 2024. Mr. Bharathidasan also contributed to the discussion by addressing misconceptions about vultures and emphasizing their ecological significance. Event organised under the guidance and support of the State Planning Commission, Government of Tamil Nadu.

Species Conservation

Flora

4.1 A study on the decline of in *Terminalia arjuna* trees

Terminalia arjuna is a large deciduous tree (local names: 'Neermathi, Neermaruthu') commonly found along rivers, dry watercourses, and streams in tropical dry and moist forests of India and Sri Lanka (Kundu & Schmidt 2015). It dominates riparian landscapes along the Moyar River, a tributary of the Sigur River, as well as the Averellah River, Anaikal River, and Sิริyur River in the Nilgiri Biosphere Reserve (NBR). The ecological significance of *T. arjuna* in NBR, MTR, and STR includes providing habitat for various species, stabilising riverbanks, and trapping sediments, as its buttress roots act as excellent soil binders. Additionally, the large crown and tall stature of *T. arjuna* are used by major faunal species such as elephants, leopards, honeybees, sloth bears, chital, grey langurs, and Malabar giant squirrels for various purposes. Hence, it is considered a keystone species of the riparian forest in southern India (Sunil et al. 2019). This species is a characteristic component of dry tropical riverine forests as well as tropical moist and dry deciduous forests. From October 2022 to April 2023, we recorded forty-four nests of White-rumped vultures in *T. arjuna* trees. Additionally, many raptors, Malabar giant squirrels, langurs, and owls also use the tree for nesting.

The objective of the study is to understand the impact of check dams on the survival of *Terminalia arjuna* and to identify locations that require replantation.

Activity

A field survey was conducted within the designated study area to estimate the number of live *Terminalia arjuna* trees. This included counting and recording live trees and documenting their locations. A transect survey method was used for this study.

Study Area

Nestled in the pristine landscapes of the Nilgiri Biosphere Reserve, our study area focuses on the perennial Moyar River, its tributaries, and surrounding environments. Originating from the upper reaches of the Nilgiri Biosphere Reserve, the Moyar River meanders for approximately 90 kilometers through the Mudumalai and Sathyamangalam Tiger Reserves before converging with the Bhavanisagar Reservoir. This region encompasses a network of tributaries, including the Anaikal, Mookuthipallam, Sigur, Sิริyur, and Averellah rivers, which originate from the Ebbanad slopes, contributing to the intricate ecosystem of the Moyar River basin.

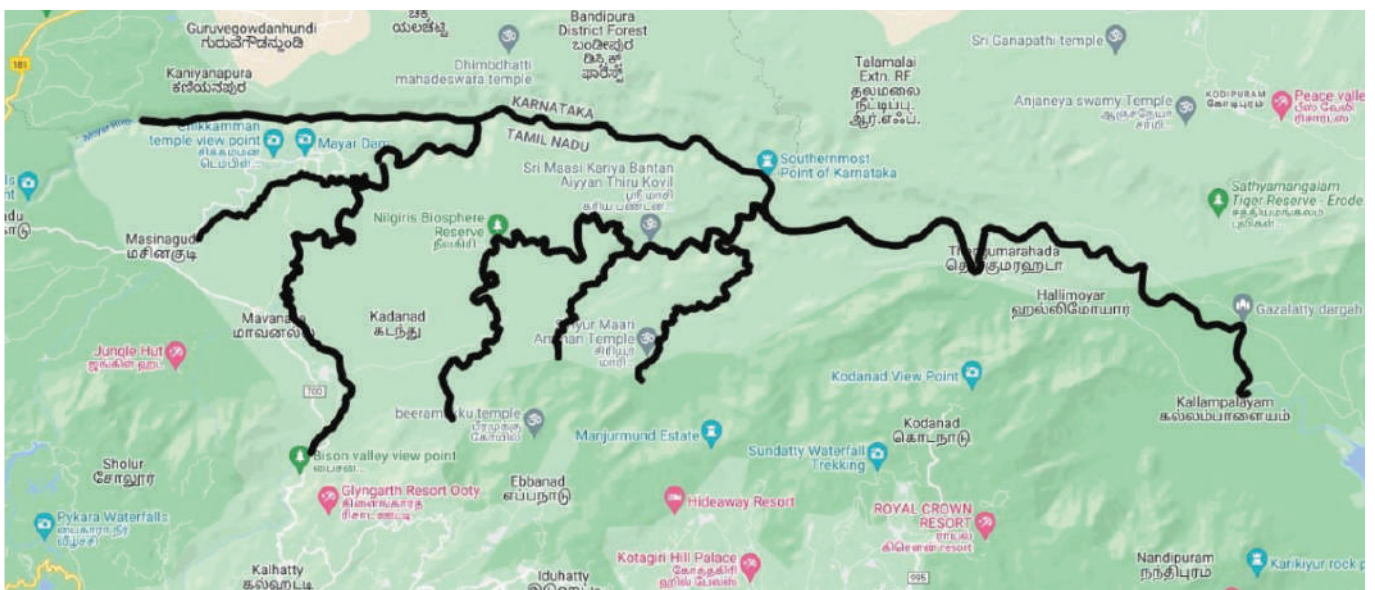
In this study, our focus narrows down to specific stretches of these watercourses,

with particular attention given to the *T. arjuna* tree, a keystone species within this ecosystem. A primary objective of our study is to survey 31 km of the Moyar River, along with 23 km of the Anaikal River, 10 km of the Averellah River, 9 km of the Mookuthipallam River, 12 km of the Sigur River, and 15 km of the Siriyur River.

Methodology *Terminalia arjuna* live and dead trees were counted using a line transect method along riparian zones in NBR. The transects were walked from 08:00 to 16:00 local time within the protected area. The *T. arjuna* count was conducted along the riverine areas of the Moyar River and its tributaries. The counting was done visually, with the help of binoculars (8x42).



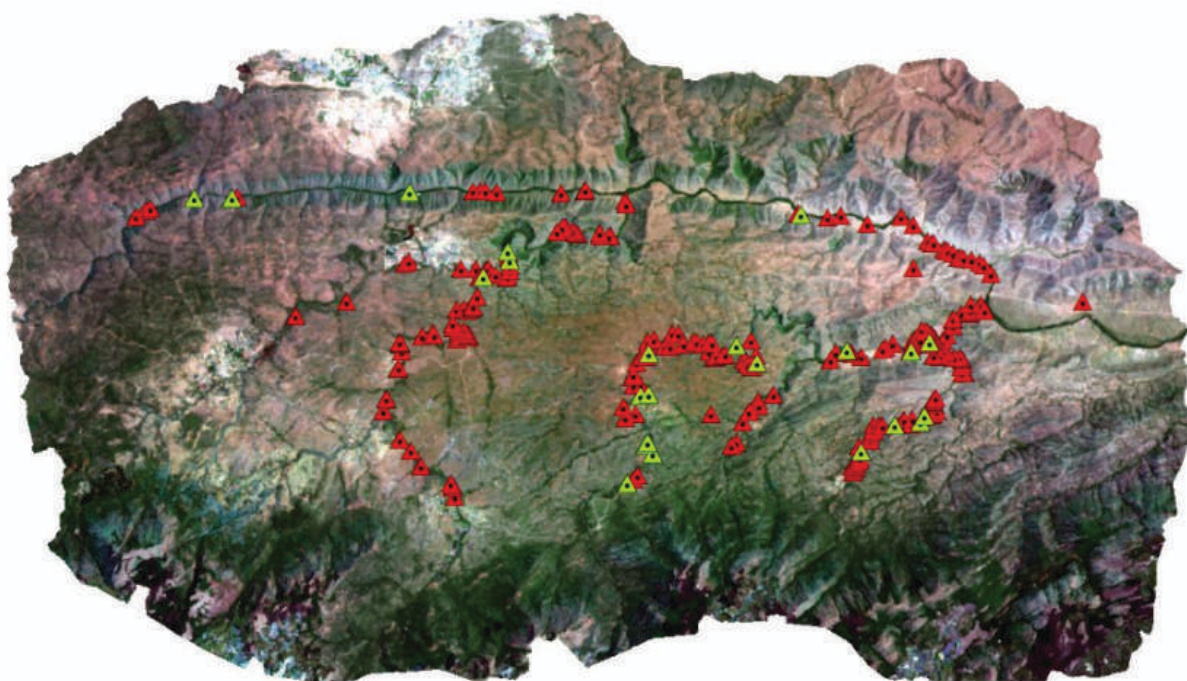
Terminalia arjuna trees



Route Map of the Study Area

Findings

| | Elevation (meter) | | River length (km) | Water sources | Live trees | Dead trees | Check dam | Vulture nesting |
|-------------------------------------|-------------------|--------|-------------------|---------------------|------------|------------|-----------|-----------------|
| | Starting | Ending | | | | | | |
| Averellah River (Location 1) | 933 | 827 | 9 | Pykara | 391 | 9 | 0 | 1 |
| Sigur River (Location 2) | 932 | 497 | 12 | Kamarajar sagar dam | 1991 | 78 | 15 | 24 |
| Anikal River (Location 3) | 909 | 408 | 23 | Ebbanad slope | 1087 | 127 | 5 | 1 |
| Mookuththupallam River (Location 4) | 839 | 480 | 9 | Ebbanad slope | 151 | 12 | 0 | 17 |
| Siriyur River (Location 5) | 916 | 424 | 15 | Ebbanad slope | 1254 | 109 | 2 | 5 |
| Moyar River (Location 6) | 655 | 417 | 31 | Pykara | 3736 | 39 | 0 | 0 |
| Total | | | | | 8610 | 374 | 22 | 48 |



8610 live trees (Red) and 374 dead trees (Yellow) which is less than 5%

4.2 Rewilding the Earth

Bandipur Tiger Reserve (BTR) is one of the best-protected areas in the world. It covers an area of about 1,000 sq. km, including buffer areas. It is one of the primary habitats of large mammals such as the Asian elephant, tiger, Indian gaur, and Indian wild dog. Bandipur is bordered by Wayanad Wildlife Sanctuary (WLS) and

Mudumalai Tiger Reserve (TS) to the south and west, and Nagarhole Tiger Reserve (TR) to the north. Large areas of Bandipur have been colonised by invasive flora such as *Lantana camara* and *Senna spectabilis*. The diversity of native flora has reduced considerably. By engaging tribal communities and villagers from forest

fringes, we hope to provide sustainable and environmentally friendly livelihoods. Their traditional knowledge of the forests, flora, and fauna is encouraged and used in the restoration efforts. Once they acquire the necessary skills in restoration work, they should be able to independently take up such projects and cover larger areas for restoration.

This project aims to remove invasive species from the forest area, allowing grass to grow, providing a green corridor for the grazing animals.

Project Site

Work started in a grassland patch of about 50 acres at the edge of the Gopalaswamy Betta Range, one of the ranges of BTR. The site has a stream that flows into a large lake. This lake is a vital water source for wildlife and the bordering villages. Owing to this criticality, this patch of forest is heavily used by wildlife. *Butea monosperma* or flame of the forest, *Ziziphus jujube*, *Cassia fistula*, and *Limonia acidissima* or wood apple are the only remnants of the once-diverse native flora. Over the last couple of decades, the landscape has degraded due to many anthropogenic pressures such as forest fires, uncontrolled grazing, and firewood collection. Of late, the Department of Forest has controlled these pressures. The presence of thick and impenetrable invasive plants is hindering ecological recovery. *Lantana camara*, *Parthenium*, *Eupatorium*, and *Senna spectabilis* are the predominant invasive species in our work area. Until December 2022, while the soil was still damp, we concentrated on removing/uprooting *Parthenium* and *Eupatorium*. Since the

start of December, we began removing *Lantana* through the Cut Root-Stock method. We started in higher elevation areas where the density was impenetrable. In certain areas, where they were densest with too many intertwining creeper-type growths, we had to slash them first and then apply the Cut Root-Stock method.

This demanded a considerable amount of manual labour. The project paved the way for local engagement and livelihood support. Betta Kuruba tribal communities from Melukamanahalli Haadi (Hamlet) were assigned the work. This hamlet borders the TR, and tribal communities have lived here for generations. Their knowledge of the habitat, flora, and fauna has been useful in executing the work. They are able to distinguish native plants amidst the invasive plants and selectively uproot only the invasives.

Challenges

Hiring skilled workers and ensuring their consistent attendance has been a major challenge. Since the work area is a wildlife movement zone, there have been frequent halts to allow free movement of wildlife while also ensuring the safety of workers. To date, the project team has cleared about 6 acres of *Parthenium* and *Eupatorium*. *Lantana* has been cleared from 13 acres.

Project Work Completion Area-Wise Details

1. *Parthenium/Eupatorium* removed from 6 hectares
2. *Lantana camara* removed from 13 hectares

Total: 19 hectares

Organisation Development with the support of Edelgive Foundation

Organisational Development of Arulagam by Strengthening staff capacity, upgrading facilities, and improving operational systems to increase efficiency and sustainability. Training programs, workshops for staff, leadership development. Utilities, insurance, and administrative costs.

Nursery Development Activities

Expanding the area for better plant production and growth conditions. Construction/renovation of nursery space, installation of irrigation systems, and drainage. New planting tools, fertilisers, soil quality enhancement, irrigation systems, pots, etc.

Fauna

4.3 Vulture numbers on the rise in Tamil Nadu vulture census

The vulture census in Tamil Nadu has indicated that the number of vultures in the state is on the rise, according to the second synchronised vulture census undertaken by the Tamil Nadu Forest Department with the participation of neighbouring states Kerala and Karnataka.

| Sl. No | Name of the Protected area | No.of vantage points | Number of individuals | | | | | Total |
|--------|-------------------------------------------------|----------------------|-----------------------|---------------------|--------------------|------------------|-------------------|-------|
| | | | White-rumped Vulture | Long billed Vulture | Red headed Vulture | Egyptian Vulture | Himalayan Vulture | |
| 1 | Mudumalai Tiger Reserve | 20 | 63 | 9 | 6 | 0 | 0 | 78 |
| 2 | Sathyamangalam Tiger Reserve | 16 | 35 | 25 | 10 | 0 | 0 | 70 |
| 3 | Bandipur Tiger Reserve | 42 | 57 | 3 | 5 | 0 | 0 | 65 |
| 4 | Billigiri Ranganatha Swamy Temple Tiger Reserve | 18 | 5 | 7 | 2 | 0 | 0 | 14 |
| 5 | Nagerhole Tiger Reserve | 15 | 26 | 1 | 11 | 0 | 0 | 38 |
| 6 | Wayanad Wildlife Sanctuary | 18 | 31 | 2 | 16 | 0 | 2 | 51 |
| 7 | Nellai Forest Division | 10 | | | | 4 | | 4 |
| | Total | 139 | 217 | 47 | 50 | 4 | 2 | 320 |

The first landscape synchronised population estimation was conducted on 25th and 26th February 2023, which estimated the total number of vultures at 246. This survey was carried out in the Mudumalai Tiger Reserve and the adjoining landscape, consisting of Sathyamangalam Tiger Reserve in Tamil Nadu, Wayanad in Kerala, Bandipur Tiger Reserve, and Nagarhole Tiger Reserve in Karnataka. These areas have historically supported the vulture population.

The second synchronised survey was conducted in Tamil Nadu on 30th and 31st December 2023. This time, Biligiri Ranganatha Swamy Temple Tiger Reserve in Karnataka and the entire state of Tamil Nadu were included in the survey.

During this survey, the vantage point count methodology was adopted at 139 locations. The survey was conducted in four sessions over two days, for a total of 8 hours, at all 139 vantage points. This census indicated the presence of 320 vultures in the state. Details are given below in the table. In order to protect the last remaining breeding population of vultures in South India, the Government of Tamil Nadu, under the leadership of the Hon'ble Chief Minister, has set up a State-Level Committee to take comprehensive measures for vulture conservation, headed by the Chief Wildlife Warden. The state has also implemented a ban on the use of Diclofenac for cattle treatment through the Director of Drugs Control, as this medicine is a major cause of the decline in vulture populations. Multiple raids were conducted across Tamil Nadu, and 104 manufacturers and sellers of multi-dose Diclofenac have



been prosecuted for selling the banned drug. Regular inspections of pharmacies are ongoing, and awareness campaigns for pharmacists and veterinarians have been organised. After post-mortems, carcasses are now being left for vultures.

4.4 Promoting Human-elephant coexistence among communities in Odisha, India

Project Goals

The goal of the project is to involve local people in the conservation of migratory elephants and ensure the long-term survival of elephant populations.

The objectives are:

1. To understand the existing conflict situation and the root cause of Human-Elephant Coexistence (HEC).
2. To foster a positive attitude among communities and introduce effective preventative and practical behaviours to avoid conflict.
3. To create momentum that would continue and build upon itself long after the project period.

The Arulagam Project Team conducted a Human-Elephant Conflict Status Assessment in the selected areas. The assessment found that HEC, which was not a significant concern two decades ago, has now been increasing alarmingly. Some elephant populations have moved their

base to the Rayagada area. People living within a 10 km radius of this area are experiencing fear and uncertainty. Changes in agricultural practices, the increased availability of palm trees used for toddy-making, and the storage of toddy inside houses for consumption and sale are some key reasons for the shift in elephant movement.

The project provided an opportunity to establish a network with village heads, school and college teachers, local officials from the Department of Forest, and wildlife and eco-conservation enthusiasts. This network also helped us identify the educators. The project team completed the proposed workshops, covering four districts in Odisha. A total of 30 educators were trained to improve their attitudes toward wild elephants in order to avoid confrontation and conflict whenever possible and save lives.

The three-day educator skills training program was very useful. Many participants from elephant conflict zones returned with a better understanding of elephants and their behaviours. Through this project, we introduced an active learning teaching methodology (a fun way of learning), which was well-received by the participants. The 30 trained educators reached out to a large number of people from different age groups.

Conservation education promotes understanding the issues and problems faced by different species and seeks solutions. The involvement of educators trained through this workshop will not only change their own attitudes but will also

create awareness among other teachers, students, and community members, fostering coexistence with elephants and helping to save them.

At the end of the workshop, participants appreciated the active learning tools, and most changed their attitudes towards elephants, understanding the root causes of the problem as evidenced by the post-workshop assessment.

4.5 Cattle Health Camp

Cattle health camps were organised in Alli Moyar, HD Kote, and Moyar village. To create awareness and provide exposure, hands-on training was conducted for 120 cattle owners. As these locations are hotspots in the Vulture Safe Zones, the program focused on ethnoveterinary practices, directly reaching our target audience. About 220 cattle benefited from this program. This event was organised by the Wildlife Conservation Foundation and Arulagam, with resource support from Kumaraguru College of Technology and Fondation Segre. Veterinary professionals Dr. Thanammal Ravichandran, M.V.Sc., Ph.D., Mr. Arunkumar, and Dr. Hari Babu, B.V.Sc., shared their expertise.

Objectives of the Program:

1. Creating awareness among stakeholders about how diclofenac usage wiped out the vulture population in India.
2. Training cattle owners to treat their sick cattle using shrub- and herb-based mixtures and potions.
3. Reducing the negative effects of diseases that make cattle unhealthy by providing alternative methods to modern drugs.

Ethnoveterinary practices are a branch of ethnopharmacology that focuses on treating cattle using herbal medicines extracted from locally available plants. These practices are re-emerging, reviving traditional ways of treating cattle diseases and ailments. Building and maintaining healthy cattle, which in turn provide a good flow of revenue, is a challenging task. The program seeks to reduce the use of chemical drugs and their harmful effects on wildlife. Global biodiversity is threatened by various factors, and one example is the impact of diclofenac on the vulture population in India and other countries. Blind use of such drugs, coupled with low monitoring awareness, caused vultures to disappear in the past. Therefore, alternative techniques for mitigating livestock illnesses can preserve livestock health without harming other faunal communities.

Local remedies for Foot and Mouth Disease (FMD), Diarrhea, Fever, Lumpy Skin Disease, and Udder Disease (Bovine Mastitis) were explained using locally



available herbs. The composition of these herbs was demonstrated, and cattle herders participated in making the medicinal mixtures. A list of available medicinal plants and their uses was also explained.

4.6 Needs assessment through FGD in VSZ

A focused group discussion on vulture conservation was conducted in the Vulture Safe Zones in Tamil Nadu. The Arulagam team organised tribal leaders and key community members for this discussion. The findings of the FGD are as follows:

| Sl.No | Villages | District | Needs |
|-------|-----------------|----------|------------------------------------------------------------------------------------|
| 1. | Boothanatham | Nilgiris | Replacement of cattle with calf in case of a cattle kill, village welfare activity |
| 2. | Vazhathotam | | |
| 3. | Chokkalanni | | |
| 4. | Anaikatty | | |
| 5. | Siriyur | | |
| 6. | Bokkapuram | | |
| 7. | Mavanalla | | |
| 8. | Achakarai | | |
| 9. | Kalidhimbam | Erode | Alternate market for the agriculture produce, Better price for the organic produce |
| 10. | Ittarai | | |
| 11. | Bejallatti | | |
| 12. | Mavanatham | | |
| 13. | Dhadasalatti | | |
| 14. | Ramarannai | | |
| 15. | AllapuraDhottai | | |
| 16. | Kodampalli | | |
| 17. | Sholagardhotti | | |

1. Vultures that were once prevalent in their area are now a rare sight.
2. Forest cover (canopy/invasive species) poses an obstacle for vultures in identifying carcasses.
3. The cattle population has drastically declined, resulting in fewer cattle deaths. These cattle that are killed

inside the forest are rarely consumed by vultures.

4. The village population has moved on to work as labourers in search of income. Some members of the tribal population work for contractors who harvest minor forest produce under the tribal banner.
5. Arulagam's compensation (with the support of India and Mariamma Trust) for cattle kills of ₹5,000 is useful; however, the money is often utilised for other emergencies or day-to-day requirements. It is suggested that the organization provide a calf instead of the cash compensation.
6. Despite the animal conflicts in the Vulture Safe Zones, a few tribal villages continue to engage in farming. The farm produce is cultivated without the use of chemical fertilisers or pesticides. Although their produce has great value, it is sold at a marginal price by local agents. With some intervention from governmental or non-governmental organisations, the farmers' produce could be sold for a better price, resulting in fair trade.

The team visited the following villages in the VSZ.

4.7 Cattle Survey

Back ground

NSAIDs, a group of painkiller drugs used largely in the veterinary sector, have wiped out more than 99 percent of the vulture population in various landscapes of India. The vulture population, which was recorded in crores, has now dropped to thousands. A couple of NSAID drugs were banned in India after the realisation that

they kill vultures. It is crucial to adopt a multi-dimensional approach to vulture conservation to stabilise the population in Southern India. This comprehensive survey documented responses from 1,358 respondents across five districts in three states: Tamil Nadu, Karnataka, and Kerala. Aspects such as the socio-economic status of farmers, livestock holdings, main constraints in cattle rearing, documented livestock mortality, compensation claims, cattle health issues, and treatment methods used were included. Effective utilisation of insurance and loans was also reported. People's perceptions of vulture species and awareness of NSAIDs are documented in vulture habitats. This survey found that most respondents fall into three broad categories: cattle herders, farmers, and estate workers. More effort is needed in all the aspects mentioned above, especially in future training programs for livestock management using ethnoveterinary medicine to completely eliminate NSAIDs in vulture habitats.

This survey found that the usage of veterinary drugs without proper guidance from government veterinarians or para-vets is significant. Therefore, making people aware of the effects of vulture-harmful drugs is essential; subsequently, these drugs should be made available only after being prescribed by a practitioner. Respondents expressed interest in alternative income generation through various minor occupations, such as compost preparation and value addition to cattle-based products. Information related to cattle insurance and loans should be communicated to all those surveyed to improve the utilisation of cattle insurance

and loans, which respondents reported using very little in this survey. Identification of NSAIDs was reported to be very low in Karnataka and Kerala. Further efforts to create awareness of NSAIDs and vulture conservation among the people in these states will be made to highlight the threats faced by vultures and to promote the ecologically important role that vultures play across their distribution in Southern India.

Core Objectives:

1. To enable the Vulture Safe Zone team to build farmer capacity and provide continued support for addressing their immediate needs for better and safer methods of cattle management.
2. To promote cattle-based alternative income generation options for herders to diversify and support their livelihood needs.
3. To influence the spread and scaling up of project experiences on community-inclusive conservation approaches through sharing events and other appropriate communication methods.

Project Findings:

This survey found that the usage of veterinary drugs without proper direction from government veterinarians or para-vets is significant. Respondents expressed interest in alternative income generation through various minor occupations, such as compost preparation and value addition to cattle-based products. Information related to cattle insurance and loans should be communicated to all those surveyed to improve the utilisation of cattle insurance and loans, which

respondents reported using very little in this survey. Identification of NSAIDs was reported to be very low in Karnataka and Kerala. Further efforts to create awareness of NSAIDs and vulture conservation among the people in these states will be made to highlight the threats faced by vultures and to promote the ecologically important role that vultures play across their distribution in Southern India.

4.8 Training for Field Veterinarians in Wildlife Disease Investigation

Goal:

Enhancing the conservation of tigers, Asian rhinos, and other endangered wildlife in Asia through improved veterinary capacity in the range countries by imparting knowledge and skills to local veterinarians in disease investigation, surveillance, and other conservation threats.

Objectives:

1. Identify local and out-of-region subject matter experts in wildlife veterinary medicine, veterinary pathology, epidemiology, ecology, and wildlife population management.
2. Host online video conferences in 2022/2023 for wildlife veterinarians with subject matter experts to establish networking, assess the needs of wildlife veterinarians, and disseminate knowledge and skills for improved disease investigation and surveillance.
3. Host hands-on laboratory training sessions at the Centre for Wildlife Research and Forensics (India) and the NTNC Biodiversity Conservation Centre

laboratory (Nepal) in 2023.

4. Support 10 veterinarians to travel to and participate in one-week (5 days) hands-on field training courses in each of the two laboratories to build their capacity and enhance their wildlife veterinary expertise to more effectively investigate and monitor disease and assist conservation efforts.

The Nepal webinar on wildlife disease investigation hosted 76 registered participants, while the India webinar hosted 110 participants, including representatives from tiger, Asian rhino, and wildlife range countries. The webinars addressed veterinary topics such as the power of pathology, wildlife disease surveillance in Nepal, tigers and their diseases, post-mortem examination of wildlife and sample collection, wildlife ecology and understanding diseases, elephant endotheliotropic herpesvirus (EEHV) monitoring and treatment, diseases in elephants, and tuberculosis in elephants in Nepal. Discussions also emphasised the need for comprehensive post-mortems, as well as the need to address veterinary issues at the interface of wild and captive wildlife populations.

Hands-on Laboratory Training Opportunities

Select veterinarians who attended all the sessions of each webinar and expressed an interest in participating in the hands-on laboratory training were identified to better share knowledge and experiences. Such ongoing practical training enables veterinarians to be more effective in their daily work.

During the webinars on wildlife disease investigation in both India and Nepal, several registered veterinarians who participated in all the sessions indicated an interest in hands-on laboratory training. From these lists, 8 local (Nepal or India-based) and 2 Asian range country veterinarians will be selected for each of the training sessions and supported to attend the training.

The Nepal hands-on laboratory training on wildlife disease investigation in Chitwan National Park was organised from November 20-24, 2023. The India hands-on laboratory training on wildlife disease investigation in Pookode, Kerala, was organised from November 27 - December 1, 2023.



Health



5.1 Bio-Medical Waste

The World Health Organization and Toxics Link brought together various stakeholders to enhance awareness and efficiency in managing biomedical waste in healthcare facilities, emphasising the need to augment and strengthen the current structure to develop a more comprehensive system that addresses the handling and disposal of biomedical and vaccination waste. To achieve this, Toxics Link organised a Training of Trainers (ToT) workshop in collaboration with the partner organization, Arulagam, in Tamil Nadu on January 19 and 20, 2023. The training helped create a pool of trainers for the state who aided in sustaining efficient biomedical waste management.

Following the ToT, Arulagam conducted cascade training at various locations, educating over 636 health workers in five districts. The health workers provided several suggestions to improve biomedical waste (BMW) disposal efficiency. The program led to the establishment of three

model vaccination centres: Chennai Bharathipuram PHC, Coimbatore Blichy PHC, and Masonic Hospital in Coimbatore. A set of four dust bins, coloured liners, masks, gloves, registers, goggles, aprons, and concentrated NaCl solution was provided to encourage the institutions to follow the biomedical waste management rules. Incorporating some of the suggested changes will result in better accountability for toxic waste and its disposal in the future.

To conclude the training program, two state-level workshops were conducted, one in Chennai and one in Coimbatore, creating a platform to discuss policy-level changes that need to be implemented. Furthermore, the impacts of unmanaged BMW were discussed through case studies and live examples. The gaps and consequences of these downward trends were forecasted in great detail, and current practices and possible course correction strategies were discussed.

Tribal Initiatives

6.1 A Project on Narikuravars to Provide Alternative Income Generation Activity as they give up Hunting Wildlife Found in Agro-ecosystem

Project Location: Mayiladuturai, Nagapattinam, Thiruvarur, Thanjavur Districts

Objectives:

- To reduce the hunting pressure on wildlife found in agro-ecosystems in Mayiladuturai, Nagapattinam, Thiruvarur, and Thanjavur districts.
- To raise awareness among the Narikurava community about the role of wildlife in agro-ecosystems.
- To educate children from the community about wildlife in agro-ecosystems and make them ambassadors to convey conservation messages to the elders.
- To provide alternative employment opportunities to encourage the community to stop hunting wildlife in this ecosystem and earn a sustainable living.

The Narikuravars are traditionally nomadic hunters of birds (herons, egrets, francolins, stilts, etc.) and mammals such as jackals, foxes, jungle cats, palm civets, and small Indian civets. They live in Tamil Nadu, Karnataka, Kerala, Maharashtra, and Gujarat. Recent studies indicate that their origin traces back to Gujarat. Nowadays, men from these communities earn a living by selling plastic goods, groceries, dolls, and other items, but they continue to hunt

wild animals and birds at night. Women sell needles, beads, safety pins, and other small items, such as cell phone and ration covers. Previously, the Narikurava community was highly nomadic, often living in bus stations due to lack of land ownership. However, today they have a more settled life in places like Pallavarayanpettai in Mayiladuturai District and Thanjavur, where the government has provided housing.

The Government of Tamil Nadu has also established a residential school for the community in Pallavarayanpettai, Mayiladuturai. Several non-governmental organizations are working to support the development of the community. NEED Trust, a non-profit organization based in Mayiladuturai, has been working for the upliftment of the Narikurava community for over forty years. The Government of Tamil Nadu has included NEED Trust in the Governing Council of the residential school. With the organization's support, more than twenty-five community members have become graduates and postgraduates.

Problems Faced by Women and Children in the Narikurava Community

Child marriages are common among the Narikuravas, with girls often becoming mothers between the ages of 15 and 18. By the time they are ten years old, children

are expected to join their elders in selling goods and hunting wildlife. They are often not allowed to continue their education. Alcohol consumption is introduced at an early age, and adolescent girls are forced into early marriages, while children are sometimes made to beg.

Poaching of Birds and Animals

The Narikurava community hunts thousands of birds and other animals in agro-ecosystems each year. The meat is sold illegally in local markets and is also consumed within the community. Many believe that eating wild animal meat provides strength and cures diseases. However, there is little understanding of the laws prohibiting hunting and poaching and the impact of these activities on the sustainability of agro-ecosystems.

Project Initiatives

1. Providing Alternative Income

Generation Opportunities: The project offers alternative income opportunities to help the Narikurava community earn a living without harming the agro-ecosystem.

2. Providing Sales Outlets Made of Steel:

The project has provided two steel stalls to two families, enabling them to sell products such as beads, ration card and ATM card covers, and dolls. These mobile stalls are fitted with wheels, so they can be moved to locations like bus stands or temples. The stalls also come with a fan, a lamp, and plug points for charging mobile phones, all powered by a solar panel installed on the top of the stalls.

3. Providing Solar Fruit Dryers: The project has provided solar fruit dryers to members of the community. The idea is to procure fruits such as bananas, mangoes, grapes, and tomatoes, along with tubers like ginger and turmeric, when they are available at low prices, dry them, and sell them in the market. There is significant demand for these products, offering the potential for better income. The dryers can process up to fifty kilograms of fruit at a time, and two more families will receive these dryers by the end of the month.

4. Providing Bird Watching Books and Binoculars for Students: The project has provided the children in the community with a binocular, two copies of "Birds of the Indian Subcontinent," fifty booklets on 130 common birds of Tamil Nadu, and fifty field notebooks. A bird-watching activity was conducted in the nearby agro-ecosystem, with Mr. D. Boominathan, Coordinator from South Western Ghats Landscape, guiding the activity.



Loading the cut Fruit in the Drier



Drying Tomato in Solar Drier



Handing over Binocular and Bird Book



Cutting the Fruit



Bird Watching Activity in Agro-ecosystem

6.2 FRA Implementation in Nilgiris district

Title of Project: Forest Livelihoods and Communications with Adivasis (Alukurumbar, Paniyar, Kattunaikkar, Irular, Kanikarar, and Kadar)

Location: Nilgiris, Coimbatore, Tiruvannamalai, and Kanyakumari Districts of Tamil Nadu, South India.

Project Objective:

To promote cross-cultural dialogue on the topic of community forest livelihoods and the implementation of the Forest Rights Act 2006 (FRA) in the Nilgiris, Coimbatore, Tiruvannamalai, and Kanyakumari Districts of Tamil Nadu State Government with the implementing agencies.

To facilitate the people to convene the Gramasabha and Forest Rights Committee (FRC).

To provide training to the FRC members about the Act and other skills to advocate with the implementing agency.

FRA Implementation Work in Nilgiris, Kanyakumari, and Tiruvannamalai Districts of Tamil Nadu

The project runs seven Community Coaching Centres in tribal habitations to support children with language barriers. The centres contribute significantly to reducing the dropout ratio from schools and function as centres of support for the growth and development of tribal children.

Women and youth conducted a survey on government residential schools in the Gudalur Block to assess the status of 13 schools and determine if children from all villages are benefiting from them. During the survey, the team identified that children from three tribal habitations were not attending schools due to the distance from their homes and the absence of adequate transport facilities. MMK Trust advocated to the Tribal Welfare Department, Government of Tamil Nadu, on the issue. As a result, the department allocated a jeep for the regular transportation of children from those villages to the schools.

Existing Gramasabha Follow-up Work

(Vachikolli, Kottayamedu, Moochikunnu, Tharppakolli, Kappikkadu, Countankolli, Kottayamattam, Bennai, Athichal, Erumaikullam, Kundrilkadavu in the

Gudalur Block; Saamagodal, Kokkodu, and Sedikkal Gramasabha in the Coonoor Block) Nilgiris District.

Tribal Traditional Sports Day was celebrated with the children from Community Coaching Centers and their mothers.

Baseline Land Survey on Land Classification in Nilgiris District

174 tribal hamlets have reported land status and identified land dispute cases in Gudalur Block, and 41 tribal hamlets in Coonoor Block, Nilgiris District.

Continued the land classification survey in tribal villages in Gudalur and Coonoor Blocks, Nilgiris District.

Training on types of land classification was provided to the working core team in Nilgiris, Kanyakumari, and Tiruvannamalai Districts, Tamil Nadu.

Cultural Communication

A music video was created and released on FRA by our Forest Life Music Team.

A documentary video was prepared on a success story of FRA implementation and the dissemination of information in tribal habitations in Nilgiris, Tiruvannamalai, and Kanyakumari Districts of Tamil Nadu.



Dried flower of Madhucalongifolia used to make toddy.



Pre-visit by project personnel

Agroecology

7.1 Arulagam & Amritabhoomi's Initiatives in Agroecology and Community Development

Arulagam and Amritabhoomi have been actively engaged in promoting natural farming, sustainable agricultural practices, community development, and environmental conservation. Some of the key initiatives undertaken over the past year include:

Agroecology Training Programs

The project team organised comprehensive training programs for over 200 farmers, equipping them with knowledge and skills in zero-budget natural farming, soil conservation, and integrated soil and pest management.

Importance of Indigenous Cattle:

The conservation and sustainable use of indigenous cattle breeds in natural farming, such as the Malendau Gidda, Hallikar, Kankrej, Gir, Ongole, and Tharparkar, were discussed. Farmers were educated on the unique characteristics, adaptability, and benefits of each breed, including their resilience, the importance of cow dung and urine, and their suitability for local conditions and adoption in natural farming.

Seed Banks:

Seed banks were established to collect,

store, and distribute native heirloom seeds, preserving genetic diversity and promoting their use in sustainable agriculture.

Positive Outcomes of Agroecology Training Programs

The agroecology training programs yielded several positive outcomes:

- **Increased Awareness:** Participants gained a deeper understanding of natural farming practices and their benefits.
- **Practical Skills:** Hands-on training enabled farmers to prepare various bio-inputs such as jeevamrutha, beejamrutha, and agniasthra.
- **Biodiversity Awareness:** Participants recognised the importance of biodiversity and ecosystem services for sustainable agriculture.
- **Seed Conservation:** Training on seed selection and conservation techniques was provided.
- **Food Security:** Improved understanding of nutrition and sustainable practices contributed to household food security through the adoption of kitchen gardening.

Weekly Direct Market

To promote natural farming and healthy eating habits:

- **Facilitated Farmer-Consumer Connections:** Farmers could sell their

produce directly to consumers at higher prices compared to traditional markets, thereby eliminating middlemen and fostering a direct link with consumers.

- **Encouraged Healthy Eating:** Consumers were encouraged to adopt healthier, more sustainable diets.
- **Fostered Community Engagement:** The market served as a platform for community interaction and education on sustainable agriculture.

Education Support for Soliga Tribal Children

Weekly educational sessions and regular after-school support were provided to Soliga tribal children, focusing on the following aspects:

- **Value-based Education:** This included out-of-classroom learning activities centred around literacy and environmental awareness.
- **Health and Hygiene:** Children were taught about health and hygiene practices.
- **Natural Farming Education:** Participatory activities like games, art, and quizzes promoted awareness of natural farming.



Outcomes Attained

- **Increased Environmental Awareness:** Children gained a better understanding of environmental conservation.
- **Community Development:** The program contributed to community development and social inclusion.



7.2 Farm Fit App

Arulagam, in collaboration with the Thalavady Farmers Foundation, launched the innovative Farmfit Mobile App on December 5, 2023, aiming to connect a broader market of farmers. Developed by Way for Farmers, this free app is currently available in Tamil, Kannada, Malayalam, and English. This mobile application will bridge the gap between farmers (producers) and consumers, eliminating the middleman and resulting in fair trade practices. Farmers will receive better prices and direct feedback from consumers every time they dispatch their products.

The app offers several key benefits, including the elimination of middlemen, crop advisories, and daily mandi price updates.

To date, we have registered over 5,000 users comprising:

- 4,000 farmers
- 1,000 traders
- 200+ Farmer Producer Companies and retailers

Mr. Balasubramani from Pollachi says, “He has been trading vegetables for a very long time. After using the Farmfit app, he is able to look at the products from his area and make a good deal. The free app is changing his business and improving the quality of his products.”



Coastal Ecology

A Sustainable Approach to Sand Dune Restoration for Nature and People in Rameswaram Island, Ramanathapuram District.

Rameswaram Island faces environmental challenges, including coastal erosion, sand dune depletion, seawater intrusion, and climate change impacts. Hence, Arulagam approached the UNDP/GEF/SGP/TERI selection team for the project “A Sustainable Approach to Sand Dune Restoration for Nature and People in Rameswaram Island, Ramanathapuram

District” to conserve the fragile sand dune ecosystem, empower the community with alternative livelihoods, and raise awareness of environmental conservation with the support of UNDP/GEF/SGP/TERI. The project has following goals and objectives:

Goal:

Arulagam aims to implement afforestation measures on a cumulative area of 51.6 hectares. This initiative reflects a strategic effort to promote environmental sustainability and combat desertification in these specific regions.





Objectives:

- To preserve and conserve sand dunes through native vegetation with local community and panchayat participation.
- To educate the community on the importance of sand dune conservation and sustainable practices.
- To train selected women and facilitate livelihood support through nursery establishment for vulnerable women who genuinely need assistance.
- To raise awareness about the importance of sand dune conservation among the local community and visiting tourists.
- To establish proven sand dune restoration techniques for upscaling and replication along the coast of Tamil Nadu.



Major activities of the proposed project include close interaction with the community, establishing a nursery and planting native vegetation, providing livelihood training, developing market outlets, designing and developing educational materials, executing education programs for various target groups like local bodies, women, youth (including school and college students), NGOs, and government departments, and evaluating project impact with proper documentation.



Key Outcomes:

- 51.3 hectares of sand dunes conserved with greenery and vegetation.
- 14 families earned sustainable income through nursery and plantation initiatives.



- Increased awareness among 12,000 families on Rameswaram Island.
- 1,800 labor days of employment generated for the residents of Rameswaram Island, improving community resilience.
- 5 plant species (*Spinifex nudiflora*, *Pandanus fascicularis*, *Salvadora persica*, Palmyra palm, *Ipomea pes-caprae*) and a tarantula spider conserved.

Arulagam is working in the ecologically important Rameswaram Island of Ramanathapuram District by putting in strong efforts and creating significant changes aligned with the core ideology of our organisation's vision and mission.

Scientific Publications

Presented a research paper titled 'Nesting Success of the Critically Endangered White-rumped Vulture (*Gyps bengalensis*) in the Sigur Plateau, with Special Emphasis on Threats to Conservation' at the 3rd Annual Research Conference. The paper was subsequently published in the journal.

Financial Statement

Receipts and Payments for the year of 2023-24

| Receipt Particulars | Income Cost (₹) | Payment Particulars | Expenditure Cost (₹) |
|------------------------------|-------------------|------------------------------|----------------------|
| Grants from Donors | 38,806,116 | Programme Expenses | ₹ 16,676,580 |
| Donations | 7,963,117 | Nursery & General Activities | ₹ 3,454,062 |
| Member's Annual subscription | 2,800 | Administrative expenses | ₹ 1,574,987 |
| Bank Interest | 369,884 | Capital expenses | ₹ 264,367 |
| Other Sources | 194,117 | Grant kept for Next year | ₹ 25,366,038 |
| Total | 47,336,034 | | ₹ 47,336,034 |

Auditing Firm : Alwin Eric & Co
Chartered Accountant
P. Alwin Eric
Membership No. 217071
UDIN: 24217071BKCMNQ3293

Arulagam Donors

TRIBAL WELFARE DEPARTMENT
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Arulagam

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