Applied Environmental Research Foundation

# ANNUAL REPORT 2022

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Red Water Lily (*Nymphaea rubra)*
PC - Akshay Varsha Gawade

# WHO WE ARE

The Applied Environmental Research Foundation (AERF) is a registered Non-Governmental Organization (NGO) based in Pune, India. Since its inception in 1994, AERF has been working towards biodiversity conservation on the ground. The Foundation applies the principles of 'community based conservation' and develops natural resource management models that actively involve local communities in the cause of forest protection to make conservation beneficial and to create a win-win situation for all the stakeholders. AERF's projects are implemented in the Northern Western Ghats that form a part of a global biodiversity hotspot in India. Team AERF also works across the country for research, training, capacity building and networking for conservation.

# OUR MISSION

**To achieve biodiversity conservation on the ground through use of scientific tools, development of cutting edge solutions and multi-stakeholder engagement**

# MILESTONES 2022

**1528**
Acres of terrestrial forests brought under conservation management

**382**
Acres of mangrove forests brought under conservation management

**927**
Biostoves distributed

**75**
Giant trees brought under conservation management

**2931**
Giant mangrove trees brought under conservation management

**37**
Acres of agroforestry agreements signed till date

# OUR CANVAS

## WHERE WE WORK

India is home to two global biodiversity hotspots, namely the Western Ghats and the Eastern Himalayas. These two sites hold approximately 6% of the world's biodiversity and make up only 0.2% of the Earth's landmass. In the Western Ghats hotspot, the southern part has received more attention since the last four decades due to large number of protected areas suitable for conservation research. However, due to the open access nature of most of the landscape and lack of legal protection in the form of protected areas, northern part of the western ghats has been data deficient. AERF has been promoting the importance of this part since last two decades and could contribute to innovative solutions for conservation on the ground in this landscape through various programmes and projects.

## THE NORTHERN WESTERN GHATS

- Part of the Western Ghats - a global biodiversity hotspot that is home to 2% of the world's biodiversity as designated by the CEPF (Critical Ecosystem Partnership Fund)
- The northern part of the Western Ghats - from Goa to Gujarat
- A mountain range that supports an immense amount of biological diversity of approximately 5000 species of flowering plants and 600 species of birds, along with many RET mammals as well.
- A biodiversity haven with several acres of privately owned forests within crucial wildlife corridor zones which are under serious threat of logging, ignorance and apathy

### OUR INTERVENTIONS

- INCENTIVE BASED CONSERVATION
- CONSERVATION OF SACRED GROVES
- ESTABLISHING CERTIFIED VALUE CHAINS FOR FOREST DEPENDANT COMMUNITIES
- BIODIVERSITY RESEARCH
- CAPACITY BUILDING OF LOCAL COMMUNITIES

# DIRECTORS' MESSAGE

It has been 27 years since we started our quest to resolve the issue of deforestation in the Northern Western Ghats (NWG) of India. Our sincere efforts and strategies to engage with local people ensured the protection to forests and ecosystems in the NWG. Along the way we built a greater constituency of donors, communities, friends and foundations to get continuous support and encouragement. Two and a half decades is a long time, but when it comes to ideas and processes about conservation in our mind, fortunately it seems like we are still young!

Like many challenging years and ups and downs in the organisational life, year 2022 was no different. AERF explored new areas and implemented new ideas. Since June 2022 we have been working in Chhattisgarh state to expand our work of value chain-based conservation. In this new initiative we successfully ensured the protection of more than 2000 hectares of forests under CFR (Community Forest Resource) using FAIRWILD certification process. In these forests we developed three new value chains, built the capacity of tribal community having rights on these forests and documented very interesting biodiversity from the deciduous forests of Central India.

Our work for mangrove conservation with the coastal communities in Ratnagiri and Raigad districts of Maharashtra, which was initiated in 2021, picked up pace and was further strengthened in 2022. It is important to address the burning issues the local communities are facing before we can expect any positive response and collaboration in conservation work. A remote coastal hamlet called Ghodabunder and its surrounding villages struggle for drinking water and are dependent on rain water collection for the same. There were many health issues arising out of that in addition to the drudgery of women fetching drinking water from far-off sources. AERF with the support of German Consulate, Mumbai established a water purification plant right on the coast and it provides water to more than 10 hamlets suffering from drinking water shortage.

AERF has been consistently working on 'Eco-chullahs' (improved cookstoves / Bio-stoves) for over a decade - improving on prototypes through efficient feedback loops. From 2016 till 2021 we distributed over 2000 Bio-stoves and the year 2022 provided an opportunity to further scale it up. AERF worked with LTIMindtree and pledged to distributed 3000 Eco chullahs as part of their Net Zero targets. Not only distribution, but conducting post-distribution surveys and stakeholders' response were equally important. In 2023, AERF will register this initiative under Gold Standard certification for validation of carbon emission reductions - first of Its kind in NWG. The Eco-chullahs proved to be an important entry point activity for local community engagement for other conservation initiatives at new locations in the NWG for AERF.

Under sacred groves conservation, restoration and management, we could enhance the protection to 7 new sacred groves that were deteriorating, through meticulous planning with the communities. The challenging work of restoration expanded to three more sacred groves in 2023. Strengthening Biodiversity Management Committees (BMCs) at village level is a continuous process and empowering them has been a major activity in 2022. Scaling up our umbrella programme of 'Conservation Agreements' in forest landscapes of NWG gained new heights and we could ensure the conservation of 1528 acres in 2022.

The approach of 'Conservation Agreements' was also used in mangrove landscape in coastal areas of Raigad and Ratnagiri district successfully. The strategy has been modified, catering to the local fisherfolk's needs and the situation on the ground. We could map and protect 382 acres of mangroves forests and 2931 giant mangrove trees using Conservation Agreement approach. It also linked our successful crowd funding campaign of 'Saving Giant trees' which was running in the NWG to the mangroves in the west coast of Maharashtra.

The year 2022 has been marked by a few visits by our funding partners and research collaborators. Addie Thompson the programme lead at Apple Inc. and Jennifer Howard from Conservation International spent a week with our team as a part of capacity building for 'Blue Carbon'.

Collaboration for value chains with Nature Connect India Pvt. Ltd. (NCIPL) - AERF's business entity - continued, and our sustainable bamboo processing unit built at Talmachi became fully functional. We facilitated the certification of value chains under NCIPL and three new value chains were brought under FAIRWILD certification from Chhattisgarh in Central India! Many ongoing projects like corridor conservation and carbon estimations of conserved forests continued making long term carbon finance a viable proposition. This is crucial for protection of these forests till posterity.

More details of every new initiative and learnings are provided in this annual report. Hope you all will enjoy reading it. It will also provide an opportunity to join hands, to contribute to the process of change. In 2023, we look forward to continued support of our donors, friends and seek advise of experts in all our endeavours. Effective collaboration, hope and efforts can certainly help us make our planet a better place…

*Archana Godbole*

*Jayant Sarnaik*

# CONSERVING THE MANGROVE ECOSYSTEM IN RAIGAD DISTRICT

In the past 5 years, AERF has invested considerable efforts in understanding the complex and sometimes troubled relationship between the mangrove forests along the Raigad district coastline and the local communities trying to find symbiosis therein. **Mangroves have also garnered a lot of attention in the global race to NET ZERO, with research indicating them to have almost 4-5 times the carbon sequestration capacity compared to terrestrial forests.**

Their role as carbon sinks may have put this ecosystem in the spotlight, but it is imperative to understand the larger ecological, social and economical landscape in order to implement any sustainable conservation measures. AERF's flagship 'conservation agreement' model links all these aspects together. This is why **we have been successful in bringing more mangrove forests under conservation agreements this year. We have also started marking and conserving individual giant mangrove trees and have already secured the future of 2931 mangrove trees.** AERF's partnerships with Apple Inc. and LTIMindtree have given great impetus to our research and conservation work in the mangrove ecosystems. There have been many studies, surveys, visits, discussions, action points which have made this achievement possible.

**We have brought 382 acres of private mangrove forests under conservation management in 2022**

## COMMUNITY VOICES

When the mangroves started eating into my farmland, I could not cultivate rice on my land anymore. For basic survival I now work as a daily wage labourer and make ends meet. After more than 30 years of accepting this destiny and sitting by in hopelessness, I was amazed that there can be some good in all this. When AERF team members gave the suggestions of planting specific trees on my farmland from which I could get regular income, I couldn't believe it at first. But as they gave me further information and showed me their value chain success stories from Alibaug and Sangameshwar, I felt confident that my farmland can definitely take on the role of a provider for me and my family again.

**Shankar Shelke**
*Village Dandanagari,*
*Mandangad*

# LINKING MANGROVE CONSERVATION TO NET ZERO TARGETS

LTI Mindtree has partnered with AERF to reach their net-zero commitments through nature-based solutions (NBS). One of the projects through which this target will be achieved is the conservation of 500 acres of mangroves in the coastal areas of Maharashtra and subsequent carbon sequestration and livelihood enhancement of the local communities. Apart from the impact in terms of sheer numbers, it is critical to understand the mini milestones in terms of perception change that cannot be put in terms of stark numbers, but are essential to reach there. We have set up a new field station at Mandangad, Ratnagiri to work on the mangrove forests along the Savitri river.

The main stakeholders here are the communities living in close vicinity of the mangroves. Both Communities and mangroves are desperate need to help improve their life. Due to salt water ingress, active farmlands have become fallows and a cause of disappointment and despair for the communities. It was important to look at the issue of mangrove ingress holistically to identify the conservation and livelihood opportunities lying therein.

**In 2022, the team has surveyed around 800 people in 50+ villages of the local communities in the process of exploring mangroves and mangrove-associated areas over 1500+ acres.** Our extensive biodiversity surveys in the mangrove forests gave us the dominant species like Miswak (*Salvadora persica*), Karanj (*Pongamia pinata*), Undi (*Calophyllum inophyllum*) which have market value and can be strategically cultivated in buffer areas. **We have also partnered with 9 previously dormant BMCs (Biodiversity Management Committees) to build their capacity to accelerate mangrove conservation efforts on landscape level, impacting way more than the initial target.** Simultaneously, we engaged with various certifying bodies to understand the process of getting the carbon credits certified and have started concentrated efforts on gathering relevant data.

We are confident that very soon this NBS project linked to mangroves will pave way for better understanding of this critical and complex ecosystem.

LTIMindtree

The team exploring mangroves with Dr. Jennifer Howard and Ms. Addie Thompson.

Community workshop on opportunities and challenges related to Mangrove conservation

# FINDING THE 'GOLD' IN THE BLUE - EXPLORING BLUE CARBON POTENTIAL IN MANGROVES OF RAIGAD

AERF has partnered with Apple Inc. USA to conserve mangroves along with west coast of Maharashtra in Raigad district. The critical role of mangroves in the fight against climate change has come to the fore - both as critical carbon sinks and as the first line of defence against the ever increasing cyclones and hurricanes. AERF has been surveying and researching these mangroves since 2017 and we signed the first conservation agreement of mangroves in the year 2021. Through this partnership, we have been able to bring 382 acres of privately owned mangrove forests under conservation management in the year 2022!

In January 2022, we held a combined community workshop for different hamlets around Alibaug. The idea was to initiate discussions about various opportunities and challenges related to mangrove conservation. More than **70 participants** from hamlets of *Ganeshpatti, Mankule, Hashivre, Bahiricha pada and Narangicha tep* graced the event. They discussed **impacts of climate change and mangrove conservation, solid waste management in the forest area, and opportunities to improve fishing techniques and develop eco-tourism.**

The concept of 'blue carbon' is still in its nascent stage owing to the vastly different social and ecological metrics across coastal sites around the world. In an effort to understand and apply learnings from similar efforts across the world, we hosted experts from Conservation International at our field site in Alibaug. In November 2022, Dr. Jennifer Howard (Vice President of Blue Carbon at Conservation International) and Ms. Addie Thompson - Grant Manager from Apple Inc. USA visited the mangrove forests of Alibaug and initiated training in blue carbon for the field team.

We have also begun marking giant trees of mangrove species and have been successful in bringing 2931 such trees under conservation management. Effectively, the associated mangrove area is also conserved through this strategy, thus making the impacted area much larger than what we see on the agreements themselves!

# ADDRESSING THE DRINKING WATER WOES OF THE COASTAL COMMUNITIES

Deborah Ludwigsdorf and Urvashi Ashar of the German Consulate Mumbai at the water ATM

Sea level rise coupled with degradation of coastal ecosystems such as mangroves has resulted in salt water ingress on a large scale on the west coast of Maharashtra and has made water from wells brackish, salty and non-potable. Our extensive surveys in remote coastal hamlets around Alibaug shed light on just how difficult it is for people to have access to basic necessities like potable water! This stark reality and daily struggle for basic needs makes it difficult to introduce the cause of mangrove conservation into the discourse. It was imperative to fix this critical issue so as to build trust with the community and open their minds to our mission.

As a response, we ideated a 'filtered water ATM' at *Ghodabunder* village which would cater to the drinking water demand from 5 surrounding villages. In 2022, AERF with support from the German Consulate of Mumbai, set up a **medium scale desalination plant which produces 20000 litres of drinking water per day** in village Narvel, Pen block. We further thought of linking this with our 'Bamboo for sustainable construction' cause and work on the plant started in January using sustainably sourced Bamboo from our Velhe conservation sites. It was spearheaded on the ground by our Velhe field coordinator - Mr. Bharat Dalvi. It is heartening to see that **people who are currently travelling many kilometres for water will get this clean life-giving resource with the tap of a smart card!** It will cater to drinking water demands in neighbouring villages and will impact and improve their life in a significant manner. It will further reiterate the importance of mangroves in restricting salt water ingress.

This initiative reiterates how forest conservation and ecosystem restoration cannot be dealt with a 'tunnel-vision' approach. Causes are invariably interlinked and strategies have to be custom-made based on extensive research and understanding of the communities and their needs.

german cooperation
DEUTSCHE ZUSAMMENARBEIT
Supported by giz

# MANGROVES - A BIODIVERSITY HAVEN FULL OF SURPRISES

Our biodiversity research teams have explored many mangrove forests along the Raigad coastline in order to understand the habitat and its unique inhabitants as well. We came across many findings which not only highlight the immense conservation potential of this ecosystem, but also the limited scope of our current knowledge and understanding about it. For instance, our team came across the Mangrove species *Xylocarpus granatum* which is very rarely found in the west coast of India, thus reiterating the need to explore these forests thoroughly to discover more such gems. We also caught the elusive Golden Jackal *(Canis aureus) and* Jungle Cat *(Felis chaus)* in our camera traps at mangrove forests in Hashivare. Another rare sight to behold was the Black-capped Kingfisher, the winter migrant Golden Plover and a flock of Greater Flamingos sighted during mangrove survey in Washi, Pen!

*Xylocarpus granatum*

The elusive **Golden Jackal *(Canis aureus)*** caught in our camera traps at mangrove forests in Hashivare.

*The biodiversity manual created based on the findings of our exploration in Raigad mangroves*

# CONSERVING PERENNIAL FRESHWATER SOURCES IN ALIBAUG

The Konkan streams originating in the Western Ghats, are short and are emptied into the Arabian Sea quickly due to the unique topography that they traverse. The steep gradients in the upper reaches make the run-off quick and also render these rivers un-navigable. They are reduced to a thread of water during summer as the basins are small and the recharge from the ground water is quite limited due to the terrain being lateritic. Hence, despite heavy rainfall in the region, streams in Konkan usually dry out in summers. In this context, perennial fresh water sources like ponds and lakes play an important role in supporting the local community, along with the resident biodiversity - especially avifauna.

Our team **surveyed 23 freshwater ponds from Alibaug** to get a better understanding of the biodiversity they harbour. We also explored the dependance of the local community on them to identify threats. We found that many lakes which had a temple in their immediate vicinity and were revered by the people, much like sacred groves, but many were also polluted and misused for washing clothes and cattle. Many were a critical water source for neighbouring orchards, yet the ignorance and lack of awareness among the local community is contributing heavily to the pollution and degradation of these important ecosystems.

Our biodiversity surveys yielded good results as well. We found many interesting flora and fauna species like the Common Indian Monitor Lizard, *Hydrilla verticillata* - an important native aquatic plant, as well as the Common Greenshank - a winter migratory bird which was interestingly seen in peak Indian summer!

As a next step we will be conducting detailed social surveys around these freshwater sources in order to get a better understanding of the relationship of the community with them. This will help us design sustainable conservation strategies by involving the local communities through different initiatives and opportunities. Meanwhile, we will be continuously monitoring these fragile, yet critically important ecosystems against old and new threats.

# CONSERVING OPEN-ACCESS FORESTS OF THE NORTHERN WESTERN GHATS

Due to the absence of an extensive protected area network in the Northern Western Ghats, much of the forest is under private ownership and threatened because of apathy and negligence from the owners and lack of economic incentives for keeping the forests standing. AERF identified this issue back in the early 2000s and has managed to bring more than 8000 acres of private forests under conservation management since the year 2008. AERF has signed 'conservation agreements' with the owners of these forests for up to 15 years. The agreement entails a complete ban on logging and ensures monetary benefits to the owners through certified NTFP value chains originating from these forests. Biodiversity and species conservation too is a natural outcome of this strategy since the habitat itself is restored and further flourishes.

**The Conservation Agreements is AERF's umbrella programme and the approach is used to secure private forests in every programme, project or initiative since 2008.**

By creating sustainable value from standing forests, we have been able to change the basic outlook of the community towards their forest. While it requires significant resource mobilisation and patience, this strategy has clearly been the only way to ensure true conservation on the ground through community participation. Since it links economics to ecology, getting all the relevant stakeholders on board for protection of these ecologically important areas becomes feasible.

**We have brought 1528 acres of open - access terrestrial private forests under conservation management in 2022**

Carbon stock assessment underway in Wadi Adhishti private forest

Conservation agreement being signed by community members of Wadi Adhishti village

# LINKING PRIVATE FOREST CONSERVATION TO NET-ZERO TARGETS

LTIMindtree has partnered with AERF to bring 800 acres of forest on private / community lands under conservation management. The primary objective of the project is to avoid deforestation for reducing carbon emissions and saving threatened biodiversity in the Northern Western Ghats. This project will result in carbon sequestration of approximately 4000 $MtCO^2$ Eq. per acre per year. The project will also build the capacity of local communities in ecosystem services conservation. Forest management activities like restoration, de-weeding, protection against grazing and trespassing will be undertaken to ensure their protection against degradation. **In 2022, we have already brought 616 acres of forests under conservation management in the villages of Wadi Adhishti and Ambavali.**

Wadi Adhishti saw a notable facet of community process unfold, whereby we could see the evidence of their trust in us getting stronger over the last 10 years. Over this time period, our team worked relentlessly towards rejuvenating the degraded patches of their community forest under our protection. We also implemented certified value chains to get sustainable economic gains from the forests and held many community meetings to update the people of the progress and health of their forests. When time came for the conservation agreement duration to expire, our partnership with LTIMindtree made it possible to propose an extension to the agreement. **During these discussions we could see our integrity and hard work bear fruit! The community members voluntarily came forward to extend the conservation area from 250 to 355 acres by adding their individual land holdings! This was a stamp of approval and trust from the community towards our work!** It is exemplar of slow but sustained efforts and of not getting disheartened in the journey. It proved yet again that integrity and hard work will definitely help you reach your target.

# ‘COOKING SHOULD NOT KILL FORESTS’ - IMPROVED COOKSTOVES TO HALT DEFORESTATION

## COMMUNITY VOICES

I have been using the bio stove for few months now and have realised that it is far more efficient than my *chullha*. Earlier, the entire house used to get filled with smoke while cooking. My children had to sit outside while I cooked. But now the smoke has reduced considerably and my coughing has also reduced. Another convenient thing is the fuel. Now my husband and I only cut the wooden branches and logs into small chips and use it in the cookstove. It burns for a longer time and I can cook *dal*, rice and *sabji* in one go without having to refill the fuel. I like the cookstove because it is easy to use and convenient.

**Nishigandha Jagannath Maeen**
*Sangameshwar*

In the year 2013, AERF developed the first prototype of an improved smokeless cookstove to distribute among the forest-dependant communities in the Northern Western Ghats. The goal was two-fold - firstly to drastically reduce the usage of firewood in the domestic context and secondly to alleviate the smoke-related respiratory issues amongst the women in these communities. Since then, we have created a feedback loop based on extensive post-distribution surveys and have continuously worked on the R&D behind this product. The uptake of this cookstove has been very positive and our surveys have reported almost a 70% reduction in the use of firewood! Furthermore, in a bid to identify a sustainable and easily available fuel source we have successfully introduced ‘catechu chips’ (a by-product of the Catechu manufacturing) as a efficient fuel for the stove.

In 2022, under the LTIMindtree partnership, we have pledged to distribute 3000 of these improved cookstoves in Raigad and Ratnagiri districts. Since this initiative is linked to their ‘net-zero’ goals, we have also commenced the process for getting the carbon credits associated with these stoves certified. **Together with the support of LTIMindtree, Apple Inc. and Credit Suisse, we have successfully distributed 927 cookstoves so far benefitting around 4000 community members - most importantly women and children!**

80%- 85%
primary usage for daily cooking

70%
Reduction in firewood requirement

LTIMindtree CREDIT SUISSE

# CONSERVING GIANT TREES IN EASTERN MAHARASHTRA

## COMMUNITY VOICES

These giant trees have been a part of our family since many generations. I remember playing under this Mango tree as a small child and my mother feeding me whilst sitting under its shade. Even though I may not think specially about this tree everyday, now that you ask me to imagine a life without it, I cannot do so! It is an integral part of our lives and it is still bringing good fortune in our lives. We will continue to cherish them for future generations as well.

**Shyamrao Bhoyar**
*Shilapur*

Many times destiny has to resort to some tragedy in order to awaken our dormant sensitivities towards a cause. The emotional effect is especially prominent with entities that have been steadfast in our lives since time immemorial. Case in point - the giant trees that have adorned our surroundings across generations; sheltering, feeding and nourishing many birds, insects and animals along with us! When such gracious gentle giants fall prey to logging and intense climate events, it shakes you to the core…

Something similar happened at our site in Deori in eastern Maharashtra where our team witnessed the ruthless felling of a giant mango tree. It revived the deep emotional ties that we have with these trees who have been there since ancestral times and kickstarted the giant tree conservation initiative in eastern Maharashtra. In 2022, we identified more than 75 giant trees of various species including Mango, Tamarind, Cluster Fig, Peepal, Banyan etc. and engaged with the plot owners to help conserve them for eternity. **On the occasion of world environment day 2022, we conducted our first community engagement session in Fukkimeta, Deori. We distributed conservation stewardship certificates and benefits to the Giant tree owners who have pledged to save them.**

We are proud to say that all the tree owners have been felicitated and offered monetary incentives for partaking in this important cause. This has changed their perspectives towards these gentle giants and will definitely cause a ripple effect within the community. This newfound sensitivity will also extend towards the vast unprotected forest areas and help in their conservation as well.

**75**
Giant trees identified and their owners felicitated

GlobalGiving

Smooth-coated Otter

# A STEP TOWARDS REJUVENATING THE RIVERS OF THE NORTHERN WESTERN GHATS

## COMMUNITY VOICES

Saptalingi is small river passing through our area, the stakeholders' workshop organised by AERF has been an eye opener, It brought our attention to the plastic pollution and our responsibility to keep the river clean. The immediate action we think is to put boards about the responsibility of villagers along the bank of Saptlingi.

**Dr. Sardar Patil**
*Principal at Athale Sapre College, Devrukh*

Many life-giving rivers originate in the western ghats and nourish several forests, human settlements and mangrove forests before meeting the sea. This is one of the most critical ecosystem services provided by these forests and there is a need to conserve the watershed as well as the forests along the river trajectory to maintain their health. However, the fact remains that many rivers in the northern parts of Western Ghats face tremendous threats due to land use change, pollution and lack of awareness among the people .

Saptalingi is one such river flowing through the Sangameshwar block. It has a watershed of 27693 acres and flows through 17 villages in the block. Our team took it upon themselves to raise awareness among the residents of Harpude, Devrukh, Pur and Math Dhamapur villages, which form the catchment of Saptalingi. Our team held knowledge sessions with school children as well, familiarising them with sources and threats to freshwater, biodiversity supported by this river and the various ecosystem services provided by the river, such as groundwater recharge - which is still the main source of drinking water in Sangameshwar. These rivers are rich in biodiversity and are home to endemic and threatened species like *Cryptocoryne cognata*, Smooth-coated Otters and Asian Small-clawed Otter.

The end goal is to work on river restoration with the local communities and such awareness sessions are critical in building their understanding of the threats and consecutive action plans to combat them. We are proud to have influenced the outlook of over 130 people through 4 different sessions and are sure that the ripple effect of this awareness will result in significant improvement in the river's health in the near future!

MSSRF
Science for Sustainable Development

## COMMUNITY VOICES

The more I research about traditional crop varieties, the more I am convinced that many non-communicable diseases are rampant because of critical changes in our diet. It is important to bring back our food heritage and bring back varieties and farming techniques that kept our ancestors healthy! I am thankful to AERF and Earthsong Foundation for their efforts in making this mission economically viable for us as well.

**Gajanan Lingayat**
*Village Kolambe;*
*active in conserving local crop varieties*

# WORKING TOWARDS FOOD SECURITY AND CLIMATE-RESILIENT AGROFORESTRY LANDSCAPES

Revitalising abandoned agricultural fields and degraded forests with potential for agroforestry activities has been one of our focus areas in Sangameshwar since the past couple of years. Our team has conducted extensive social surveys to understand the lost food heritage of the region and to carefully select species for revival and propagation which are symbolic of this heritage and also have the potential to bring economic benefits to the farmers.

Our partnership with Earthsong Foundation concretised these objectives and helped us develop agroforestry sites and bring previously fallow farmlands into productivity. The local community has also shown great interest in building their capacity, learning about different varieties of crops and certification of these value chains. Together we have been able to explore farming of High-curcumin Turmeric of the Waigaon variety and Konkan Red Rice (local variety known as *Khamadi*) in the farms. Plantation of economically important trees like Native Cashew in agroforestry sites has also given good results and the farmers have realised the cross linkages between forest health and productivity of these endeavours.

We could see the commitment and traditional knowledge of the local communities shine through this project. Some farmers, like Gajanan Lingayat, are devoted to conserving the local crop varieties. Others like Mahendra Karambele, are interested in implementing new farming ideas and promoting organic farming. The agroforestry work is leading the development of a new management system for degraded forests that will fulfil the communities' economical needs as well as restore the habitat of rare, threatened, and endemic flora and fauna. Additionally, it is creating livelihood opportunities for the local people through the restoration and ecological management of degraded forests. AERF will further focus on increasing the productivity of the selected crop varieties and achieving a conservation target of 50 acres of agroforestry sites which will be studied thoroughly for its ecological diversity.

**36.70**
Acres of agroforestry sites developed

**3532**
Seedlings of 8 species planted this year

# THE 4 FEET JOURNEY TOWARDS THE SKY - REDEFINING THE SUCCESS METRICS FOR A PLANTATION CYCLE

Saplings being geo-tagged by our team member Mr. Sanjay Pashte

AERF has been working to conserve and restore degraded private forests in village Managavli in Sindhudurg district since the last 2 years now. Plantation activities have been a priority in the entire forest management strategy and saplings of Karanj (*Pongamia pinnata*) have been carefully chosen in order to create a profitable value chain for the community and to make land restoration ecologically sound.

Plantation is a brutal game of survival, the severity of which is determined by the unique anthropogenic issues associated with each site. In Mangavali, the frequency of forest fires and uncontrolled grazing was a cause of worry. The entire seasonal cycle of the first phase of the Karanj plantation of 2000 saplings had resulted in a survival rate of 28%. Although less than expected, this gave us a chance to critically assess the situation and move on to the second phase of plantation with the odds stacked in our favour. We geo-tagged the surviving saplings and documented their heights. As for the second phase of plantation in June 2022, we were determined to give the 5000 new Karanj saplings the best chance of survival! It was time to put our learning into action. We were at an advantage with the erratic monsoon cycle extending upto Diwali. Hence, when our team went for survey and upkeep of the plantation sites in October, we were filled with optimism! **Out of a total of 7000 saplings, prime facie evidence showed that more than 6000 saplings had made it till October - with almost 20% of them reaching of 3-4 feet in height!** If we take a moment to really understand this journey from ground level to 4 feet, it becomes clear that it has spanned over 5 season changes and critical supportive intervention by the AERF field team. THIS is how important and investment-heavy the nurturing stage is for any sapling and that is where our focus should be whenever we take up any plantation activity.

We must remember forever that the **actual activity of plantation is merely the first baby step towards the huge goal of forest restoration.** What matters the most is how many individuals see through foreseen and unforeseen challenges to become strong resilient trees that will contribute to the exemplary symbiosis in nature.

Harvesting of Arjuna bark (*Terminalia arjuna*)

Fairwild certified Haritaki processing center at Talmachi made entirely in Bamboo sourced from our Velhe site and carbon-negative eco-panels

# NTFP VALUE CHAINS FOR SUSTAINABLE LIVELIHOODS AND FOREST CONSERVATION

AERF pioneered the first FairWild certified NTFP value chains in India back in 2015 which successfully brought sustainable economic benefits to the communities in the Northern Western Ghats in lieu of forest conservation. Since the past 8 years, the enterprise has only been growing and more sites have been added to our repertoire. Our story has also been exemplar in creating linkages between communities, conservation and commerce. Now we are looking forward to honing partnerships to replicate this successful approach with different communities across India.

We added the Talmachiwadi site in Junnar block of Maharashtra to our portfolio of FairWild certified sites last year. We built the Haritaki processing centre at Talmachi entirely in Bamboo sourced from our Velhe site! We made use of **carbon-negative agro-bio panels** developed by 'Strawcture Eco' for roofing and walls upon a **superstructure made entirely of Bamboo**. This underlines the potential for creative cross linkages between value chains that can make them more sustainable!

The Nature Conservancy - a global environmental organisation has signed AERF as their knowledge and implementation partners for exploring NTFP value chains in Kanker district in Chhatisgarh. It will be interesting to use our experience and learning to bring conservation benefits to the communities of this landscape as well - especially in the context of Community Forest Resource area (CFR) as against privately owned forests. Initial surveys have indicated that the community is engaged in collection of Bibhitaki, Arjuna, Bel, Salai and Haritaki. The sustainable harvesting and certification process will positively impact the protection of 2000 hectares of CFR area!

To begin with, we hosted the TNC team at our certified forest patches and sacred groves in Sangameshwar where Bibhitaki collection takes place. We held detailed discussion on the approach and activities in the first year of the project - including forest surveys, market research and community engagement. AERF's private arm - Nature Connect India Pvt. Ltd. (NCIPL) was given the responsibility of implementing the FAIRWILD and Organic certifications of these CFRs and providing market access for the certified ingredients by securing purchase guarantees from the international buyers.

CREDIT SUISSE  Nature Connect  The Nature Conservancy

# CONSERVING SACRED GROVES OF THE NORTHERN WESTERN GHATS

Sacred groves have always maintained a special place in our hearts since they showed the importance of corridor conservation and helped us bring private forests of Northern Western Ghats under conservation management since the past 28 years. **In todays times when concepts like 'ecosystem services' are being leveraged to facilitate the cause of forest conservation, these old growth forests find themselves in focus yet again by providing these services in an exemplary manner!**

However, the strong belief systems which have contributed greatly to the preservation of these forests are under threat and there is a need for constant efforts to increase awareness and reconnect communities with this biodiverse heritage. AERF's decades old relationship with the communities have facilitated this greatly and we have been successful in driving **collaborative conservation and management work on the ground for many sacred groves in 2022 as well.**

The deeper we dig into these heritage ecosystems, the more pressing and relevant we find the cause of protecting and rejuvenating them! We will continue our decades-old mission through new and innovative strategies which will resonate with the sensibilities of the young stakeholders and also bring nostalgia to the older generation who have revered them as the residence of the divine.

**We have drafted the management plans for 20 sacred groves in 2022 and begun work on 5 out of them…**

Meeting with the Grampanchayat members of Hativ village

# CONSERVING THE SACRED: RESTORING FAITH AND SPECIES, RESPECTING TRADITIONS IN THE NWGs

Arresting degradation of sacred groves and restoring them is a high priority objective for us. ATECF has partnered with us in this mission and we have been successful in carrying out intensive restoration work in Borsut, Nive Khurd and Hativ sacred groves in Ratnagiri district.

The team carried out surveys and mapped the sacred groves to identify the level of degradation and profile the vegetation and dominant tree species. Next step was to conduct extensive community meetings to create awareness about the need for ecological restoration, understand their perception about the to involve them in the restoration plan, process and timeline.

Restoration is a labour intensive and investment-heavy process, but is critical in bringing back the health of the forest and give the existing trees the best chance at flourishing and reaching their full potential of growth! The major activity under the restoration plan was to remove the invasive climbers and shrubs. We observed that immediately after this, the trees started to spread their branches and grow a canopy comparable to their girth and height! With sunlight finally reaching the ground, many near-dead trees were revived and started their journey skywards!

The team carefully selected native tree species for plantation in these sacred groves in monsoon and planted around 400 saplings of species like Bibhitaki, Karanj, Kilcha, Kokum, Kadu Kavath among many others. They also placed boulder fences to protect the plantation. The survival rate in the second half of the year was recorded at 89%. As the trees were freed and the sites became accessible, we observed a marked increase in frugivores like Barbet, Coucal, Black-hooded Oriole, Green Pigeons, and Blackbirds, along with Indian Palm Civets and Wild Pigs. This indicated a slow but sure progress towards our mission in this project!

# LEVERAGING SOCIO-ECONOMIC BENEFITS OF ECOSYSTEM SERVICES FOR CONSERVING SACRED GROVES

Our Devrukh field coordinator Mr. Gunwant Mahajan submitting the Sacred Grove Management plan to the Sarpanch at Gavtale GramPanchayat office

Due to changing belief systems and other anthropogenic pressures, it has become important to take conscious efforts to protect sacred groves. As a first step, we partnered with the World Land Trust and explored Dapoli, Khed, Mandangad, Ratnagiri, Lanja, Rajapur and Mhasala blocks to identify more than 50 sacred groves which are in various stages of degradation and need for intervention. After successful block level meetings, we approached villages for community meetings with specific agendas for long-term management of the sacred groves.

We held detailed meetings in villages of Gavtale, Mirle, Sakhloli, Pat, Devhare and Wakavali where we discussed about our already successful implementation of NTFP - based value chains in sacred groves of Sangameshwar block. We also informed them of other management activities like restoration and upkeep of perennial streams etc. This piqued the interest of the community and they were keen on developing such activities in their sacred groves as well. So much so, that few villagers from Gavtale even visited our forest and sacred grove conservation sites in Devrukh where they saw the restoration work and our nursery of native tree species along with the FairWild Organic certified Beheda trees and our processing units. After these meetings, our team prepared the management plan for 20 sacred groves in Mirle, Tisangi, Sakhaloli, Kumbhavade, Dauli, Pangari and Kuduk Khurd. Of these, we could immediately start with the implementation of the management plan in Gavtale and Mirle with support from the community members. Our team conducted training sessions on value chain development and NTFP collection. They also carried out restoration and plantation activities and held continuous stakeholder meetings for truly participative efforts.

We got a definitive sign of our impact when villagers from the neighbouring village of Surle showed up voluntarily for the Sacred Grove meeting at village Pat and exhorted us to take up restoration and management work in their sacred grove as well! We hope to bring as many groves as possible under this initiative soon…

Yellow-browed Bulbul

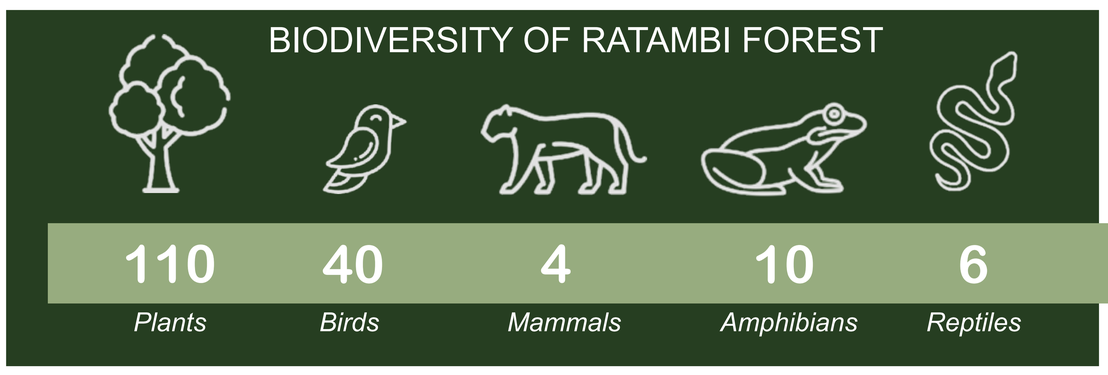
# CAN SMALL FOREST FRAGMENTS SAVE GLOBALLY THREATENED BIODIVERSITY? A CASE STUDY OF RATAMBI DANG...

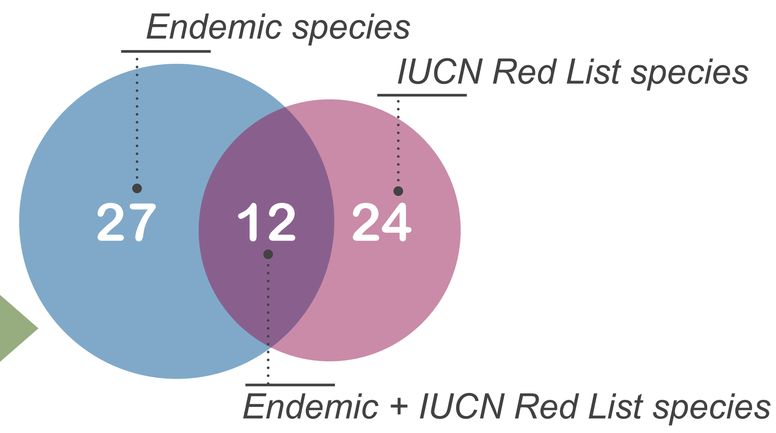
Mr. Sarnaik with the custodian of Ratambi *dang* - Mr Sachin Patole

It is a well known fact that conservation of healthy corridors is instrumental in maintaining a viable population of many threatened species across different taxa groups. It is often argued that small forest fragments located in the corridors are ineffective in conserving biodiversity. Our research and on the ground efforts have in fact proven otherwise. Traditionally protected old growth forest fragments in the Sahyadri-Konkan corridor in the northern Western Ghats have helped in persistence and conservation of many globally threatened species.

Through support from the National Geographic Society, our team mapped and studied some 19 old growth forest fragments across 4 blocks of Ratnagiri district namely, Lanja, Sangameshwar, Khed and Mandangad in Ratnagiri district. These fragments locally known as ***Dangs*** were surveyed with the key objectives of knowing their conservation status, practices influencing their management and presence of globally threatened species in these patches. In one of the old growth forest fragment belonging to village Ratambi spread over 3.44 hectares, our team documented some 60 species of plants (out of 110 species documented from the entire Ratambi forest) and 40 species of birds out of which 6 species featured in IUCN's Redlist of species in ***Vulnerable*** category. This establishes the importance of these fragments in conservation of endangered species.

In order to maintain socio-cultural and ecological integrity of these important habitats, we brought 11 forest parcels spread over 100 acres located on private lands in the adjoining area of the forest fragment under conservation management through incentive mechanism. Moreover, we also felicitated the local custodians of biodiversity in recognition of their important traditional practice of conservation of these forest fragments.






NATIONAL GEOGRAPHIC

# EARTH EXPEDITIONS INDIA IS BACK 'ON-SITE' AFTER 2 YEARS OF VIRTUAL TOURING OF THE NORTHERN WESTERN GHATS!

## COMMUNITY VOICES

Witnessing AERF's conservation efforts on the ground where they put 'people first' as defined by their participatory approach, I have realised that my own conservation principles resonate with it a lot. Even the commitment shown by the local community towards these efforts is exemplary and goes to show that this approach does work. I wish AERF all the best for the future!

**Christine Froschl**
*Participant in Earth Expeditions India 2022*

After a gap of two years amid COVID lockdowns, we were extremely delighted to host this year's Earth Expeditions India field course in partnership with Miami University and Project Dragonfly. As is routine with EE India participants, we together explored the rain-drenched forests of the Western Ghats. The focus of EE India has been to understand the critical linkages between species deities and communities of the western ghats. Sacred groves play a huge role in elucidating this link. We took forward our 8 year old partnership by introducing the participants to various sacred groves, sharing stories and legends about the deities and discussing the role of sacred groves in the cause of forest conservation. The students also learnt how the local communities live in harmony with nature and the role of traditions and faith systems in biodiversity conservation.

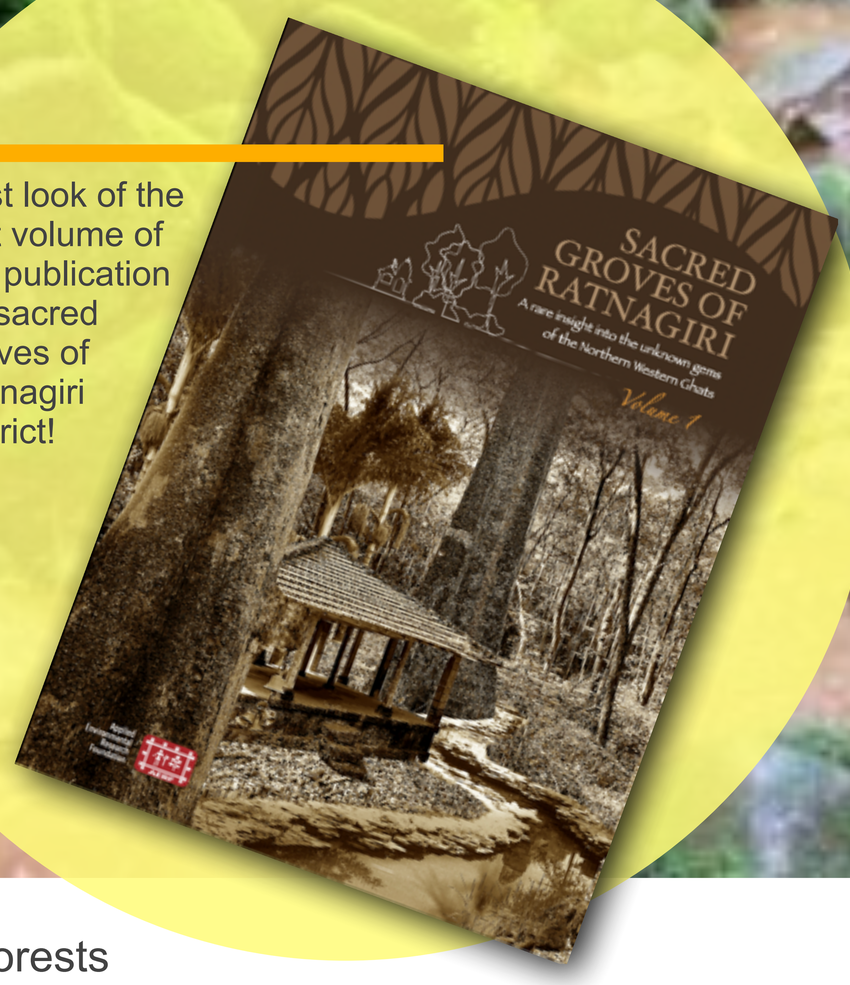
The Earth Expeditions participants play an important role in our routine monsoon plantation activities. They have forged a deep relationship especially with Kule sacred grove where the participants have been actively engaged in various restoration activities year after year. This year they took Borsut sacred grove under their purview! In the first week of June, our team had planted the stumps of *Euphorbia nerifolia, Vitex negundo,* and *Adhatoda vasica* along the roadside boundary of the sacred grove and plantation was scheduled for the last week of June. But, by that time shrubs and climbers that were cut down in summer started to regrow and seeds of *Mucuna pruriens* had germinated. Hence, the labour team again had to clear the area before the plantation. The Earth Expedition team joined the restoration and plantation activity and a total of 391 seedlings of 25 tree species were planted on the cleared patch of the sacred grove!

It has always been a pleasure to host the Earth Expedition team members and share phenomenal legends and stories about sacred groves with them…

Project Dragonfly
Inquiry | Community | Voice

Earth Expeditions

# DECADES OF EXPLORATION OF SACRED GROVES WILL NOW TRANSPIRE INTO AN IN-HOUSE 'ATLAS'




First look of the first volume of the publication on sacred groves of Ratnagiri district!

AERF has had the rare opportunity to extensively explore the old-growth forests of the Western ghats, interact with the local community and revel in the stories and legends surrounding these mystical spaces, thriving with endemic and rare biodiversity. Furthermore, we have been able to implement conservation measures in many of these groves and contribute to the well-being of these historically and spiritually significant spaces.

Since many years, we have tried putting our enthralling, multi sensory experiences on paper but words have always fallen short. So, what we decided to do finally is provide an encapsulation of our findings, interventions and stories in the form of a publication titled 'Sacred groves of Ratnagiri'. Our intention is to highlight the sheer diversity within the realm of sacred groves in terms of history, legends, biodiversity and the threats they face as well. Work on the first volume is well underway and will be published by mid-next year. We are documenting 60 sacred groves from the blocks of Mandangad, Dapoli, Khed, Ratnagiri, Sangameshwar, Lanja and Rajapur blocks of Ratnagiri district. The emphasis has been given on cultural practices within the groves that are being followed till date, specific legends and myths associated with sacred groves. We will forever be grateful to all the community members and knowledge holders who patiently provided us with critical information and revealed to us the many secrets of their culture and traditions around the sacred groves. The details provided here may invoke a sense of responsibility among the readers and some may take up this as  cause and  to work on the ground for conservation.

However, this is just a beginning of what is envisioned as a series and we are excited about introducing these sacred forests to our readers.

Depicting never-before insights into

# 60 sacred groves

of Ratnagiri district

- Cultural practices
- Biodiversity
- Threats
- AERF's interventions

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Ms. Sangeeta Pandit *Consultant*
Mr. Kajal Barman *GIS Analyst*
Mr. Omkar Pai *Field Researcher*
Mr. Abhishek Nangare *Jr. Field Researcher*
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Mr. Pramod Hatwar *Field Assistant*
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# OUR ADVISORS

**Mr. Sanjay Upadhyay**, Advocate, Supreme Court of India, is the founder and managing partner of the India's first environmental law firm, Enviro Legal Defence Firm. He also established the charitable arm of the Law firm through the Environment Law and Development Foundation. Mr. Upadhyay has over 20 years of experience in environmental law and is an advocate at the Supreme Court of India - the Apex body for legal matter in India. He has substantial experience in rules and regulation related to forest governance and is currently member of the committee formed by the Government of India to study the regulatory regime related to felling of trees grown on private lands in India. He has served as an environmental and development law expert to most well known International, multilateral, national and state institutions. He has been part of Drafting Committees of several forest, wildlife and biodiversity related legislations both at the national and state level.

**Dr. Eduard Niesten** earned his Ph.D. in Applied Economics from Stanford University in 1998. His work and research concentrate on comparing the effectiveness of different conservation approaches, with a particular interest in direct incentives and sustainable finance. He currently leads financial planning, cost modeling, business planning and benefits sharing at EcoAdvisors. He previously spent 14 years at Conservation International as Senior Director of Conservation International's Conservation Stewards Program where he oversaw a portfolio of more than 50 projects around the globe that pursue compensation-based conservation with local communities in developing countries. Strategies for ensuring long-term viability of these initiatives include dedicated trust funds, targeted government programs for conservation and poverty alleviation, and sustainable nature-based enterprise.

**Dr. S. Natesh** is a recipient of the 'Biospectrum Lifetime Achievement Award (2012) for his contribution towards taking the Indian Biosciences sector to new heights. During his tenure at the Dept. of Biotechnology (DBT) of the Government of India, he headed several divisions and built robust international collaborations for DBT whilst also leading a campaign to bring overseas Indian bio-scientists back to India! He is currently a Sr. Consultant and Project Coordinator at the DST Centre for Policy Research at IIT-Delhi and will soon be coming out with his book on the iconic trees of India.

**Dr. Jean Phillipe Puyravaud**
A well known ecologist contributed to understand vegetation patterns and peculiar species from various regions in the Southern Western Ghats. He is a rare combination of a researcher and a conservation practitioner.

**Dr. Mark Lethbridge** has research interests in wine quality detection using active optical instruments, wine yield estimation, chain of supply issues in agriculture, vegetation condition monitoring using field and remote sensing, optimization algorithms, decision support tools in production and natural resource management and ecological, movement and spatial modelling. Together with Dr Micheal Westphal, he developed OPRAH, a landscape restoration prioritization algorithm used in NRM.
Dr Lethbridge has 15 years of field biology experience in radio tracking, mark recapture and mark resighting and has undertaken everything from small mammal pitfall trapping to medium-sized mammal treadle trapping to perfecting camel immobilization techniques with Dr Wayne Boardman. He is currently developing new and innovative ways to capture species vital rate and population growth rate data remotely using camera traps and improved aerial survey techniques.

**Dr. James Danoff Burg** is the Director and Founder of Big Sky Consulting and is dedicated to providing creative, science-based conservation and education solutions for NGOs, zoos, and aquariums. His twenty years in grant writing, strategic planning, evaluation, community-based conservation, biodiversity surveys, curriculum creation, and public outreach help him to be a global leader in conservation, education, and strategy. Dr. Danoff-Burg's graduate training focused on insect and marine invertebrate conservation evolution and ecology. For the past two decades, his research, teaching, and conservation implementation actions have focused on reducing the negative effects of human activities on biodiversity through conservation education

**Dr. Alan Hamilton**, PhD, ScD, FLS, has been in the field of professional conservation and has also worked as university lecturer in the UK and Uganda for many years. His research specialty is the history of climate, forests and land use in central Africa. He was a founder of the People and Plants Initiative, a joint programme of WWF, UNESCO and the Royal Botanic Gardens Kew, designed to raise global capacity in applied ethnobotany . In 2009, Alan was made an Honorary Professor in the Kunming Institute of Botany, Chinese Academy of Sciences in recognition of his collaboration on conservation with Chinese scientists.

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**Applied Environmental Research Foundation**
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info@aerfindia.org
www.aerfindia.org
www.myforest.co.in
www.natureconnectindia.com