



Restoring  
**TRADITIONAL LANDSCAPES**  
in the Nilgiris

**EDHKWEHLYNAWD**  
BOTANICAL REFUGE





The upper reaches of Silent Valley National Park are a part of the southwest Nilgiris



The shola-grassland mosaic is typical of the Upper Nilgiris



Toda sacred stream in rainforest

The Edhkwelynawd ('place with a spectacular view' in Toda) Botanical Refuge (EBR) is a small oasis in the Upper Nilgiris of south India where a silent movement to restore an ancient ecological landscape is taking shape with the effort of ordinary citizens.



Satellite image of the Nilgiri Biosphere Reserve

This area is situated eleven degrees north of the equator and forms part of the Western Ghats complex, which is a global biodiversity hotspot. The Nilgiri massif is located at the convergence of the Western and Eastern Ghats thus endowing it with unique ecological and geological characteristics. The Nilgiri mountainous block has an eastward tilt and is characterised by several peaks that rise to above 2,400m. The mountainous terrain

of the Nilgiris has led to a great diversity of vegetation, ranging from evergreen rainforests, moist and dry deciduous broadleaved forests, thorny scrub forests and lowland savannas, to the highland shola-grassland ecosystem, which also includes wetlands. Shola or stunted evergreen montane forests with trees less than 20 m high nestle in the perpetually moist hollows between folds of the extensive grassy hills, where they are protected from

wind and fire. The characteristic ecological feature of the Upper Nilgiris plateau at above 1800m MSL is the shola-grassland ecosystem. Known as a 'climax' ecotype, it is presumed that, along with the high degree of plant endemism seen in the Upper Nilgiris, this is a result of a combination of three major factors: the Gondwanaland connection, the upland island effect and the harsh climatic controls that have prevailed from ancient times on this landscape.

By the time the Himalayas were formed, during the Middle Eocene epoch, the montane flora of the Western Ghats of south India had already acquired a distinctive character, and this became even more pronounced by being isolated due to increasing drought conditions over

the Indian subcontinent. For example, some of the Nilgiri *Impatiens* (wild balsams) species, like *Impatiens munronii* and *Impatiens jerdoniae*, are directly related to African species, and can be linked to a common ancestor from an unknown family in ancient Gondwanaland. Since the existing sholas are presumed to be relics of what were once far more extensive primeval forests dating back to Gondwanaland, they are sometimes referred to as 'living fossils'. The species that survived the drought managed to do so by becoming isolated within montane forest and grassland refuges in the Western Ghats. Long periods of isolation during intense drought conditions led to their evolution into distinct, endemic neo-species. The fact that the



A Gondwanaland relic: *Impatiens munronii*



Moist deciduous habitat around the Moyar Waterfall



Dry deciduous forests of the Moyar Gorge, one of the outstanding geological formations of the Nilgiris.





Nilgiri Upland Island: the western edges of the Nilgiris are in the form of steep escarpments



Harsh climatic controls like ground frost contributed to biodiversity development in the Nilgiris

western edges of the Nilgiris are in the form of extremely steep escarpments ensured that such plants had no chance of mixing with their parent stock, thus enhancing their isolation. It is no coincidence that a majority of the Nilgiri endemic plant species are found near these western cliffs. It is for this reason that the upper plateau is sometimes referred to as the Nilgiri Upland Island. As far as this portion of the Western Ghats is concerned, it is apparent that climate changes in the past led to the creation of its phenomenal biodiversity. This is a pertinent point worth remembering in this age of global climate change.

The Nilgiris is home to several endangered mammals, such as the Nilgiri Tahr, Tiger, Nilgiri Langur and Nilgiri Marten, as well as flagship



A tiger around a Toda hamlet



Himalayan guests: Blue-capped Rock Thrush are winter visitors to the Nilgiris.



Nilgiri Jackal



Nilgiri Tahr - *Nilgiritragus hylocrius*

bird species like the Nilgiri Laughing Thrush. But it is not the fauna so much as the flora that gives the Nilgiris its unique position in the entire Western Ghats. In this connection, two points need to be considered.

The first is the presence of a large number of what are basically Himalayan genera in this area. These include the *Rhododendron*, *Lilium*, *Ilex*, *Geranium*, *Berberis*, and many others. Some mammals, like the Nilgiri Tahr, Nilgiri Marten, and birds such as the Nilgiri Laughing Thrush, also have their closest relatives in the distant Himalayas. Some identical floral species like *Impatiens chinensis*, *Satyrium*



*Impatiens denisonii* - endemic to upper Nilgiris



Himalayan connection: *Satyrium nepalense* in the Nilgiris



and in Sikkim



*nepalense* and *Geranium nepalense* are found in both the Nilgiris and in the Eastern Himalaya, which lies at the far diagonal end of the Indian subcontinent.

The second point is that this tiny area has almost a hundred endemic plant species and varieties that are not found anywhere else on earth (thus making it one of the most important areas of plant speciation in south India). Of these endemic species, the *Strobilanthes* and *Impatiens* genera are the most significant. Each of these is represented by around thirty-five species in the Nilgiris, with *Strobilanthes* having six endemics and *Impatiens*, around fifteen.

The Nilgiris is now a major tourist destination, and sadly, has all the trappings of a modern Indian hill station. But there are two protected national parks: Mukurti and Mudumalai, the latter now a National Tiger Reserve. These two national parks form the core areas of the Nilgiri Biosphere Reserve (NBR), the first of its kind to be established and be UNESCO-recognised in India. This reserve spans over 5500 sq. km., and the Nilgiris not only constitutes its heartland, but also lends it its name.



*Strobilanthes kunthianus* mass flowers in twelve-year cycles

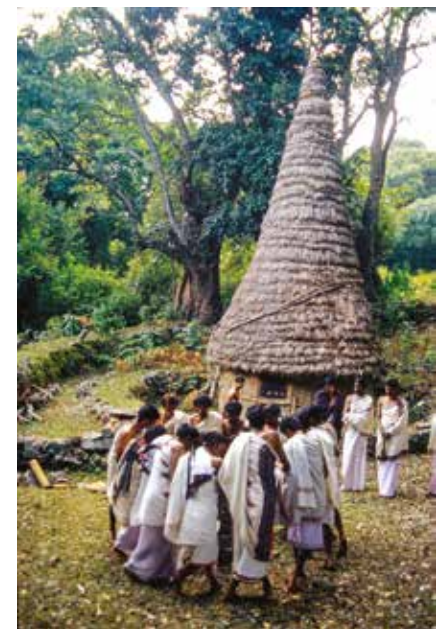


Toda menfolk praying for general well-being, especially of ecosystem

At a time when the Nilgiris is celebrating its bicentennial in 2019, it is worth remembering that these hills have been occupied by the indigenous groups since ancient times, and indeed, the unique flora and fauna were the original colonisers!

The Todas are the oldest inhabitants of the Upper Nilgiris plateau, having lived here since ancient times. With their quaint barrel-vaulted temples and houses, their embroidered *pootkhull(zh)y* cloaks and their magnificent long-horned buffaloes, the Todas have fascinated the world ever since 'civilisation' stepped into the Nilgiris two centuries ago.

Both the Todas and their beloved breed of buffaloes are restricted to the Nilgiris. Their culture revolves around these herds, with each of the six grades of dairy-temple having its corresponding herd of sacred buffaloes. Only one who has become a dairyman-priest, following the elaborate ordination ceremonies specific to each grade, may milk the corresponding grade of sacred buffaloes, and ritually process the milk into butter, buttermilk, curd and ghee (clarified butter).



Toda menfolk dance and compose songs at the most sacred Konawsh temple.



A pristine Toda hamlet

The Todas' relationship with nature begins with their birth rituals. The neonate is merely a passive participant, but its mother is required to handle a number of specific plant species to validate the ritual activity. Later, during the infant's naming ceremony, the grandfather uncovers the child's face outdoors for the first time, pointing out to his grandchild various elements of the natural environment: the rising sun, the birds, the buffaloes, bodies of water, etc. The infant will be named after one or another of these surrounding natural phenomena.

The Todas' pastoral way of life, combined with their non-martial, non-hunting, pacifist, and vegetarian lifestyle (all very rare traits among indigenous groups) has surely played a significant role in ensuring the survival and prospering of the flora and fauna that surround their settlements. Even today, Todas meet with introspection, rather than anger and a desire for revenge, the loss of a buffalo to a predatory tiger residing in the vicinity of their hamlets. Extraordinarily, they are able to accept their loss as being a kind of benediction.



Taihhb-warshy-pahh:  
a waterfall sacred to the Todas.

The Todas' intimate link with nature is one of the factors that has endowed the Nilgiris with such a high degree of bio-cultural diversity. It is a fine tribute to this people and to the values they espouse that their sacred homeland has become the heart of India's very first biosphere reserve. What we now know as the Mukurti National Park and its environs has been a part of the Toda homeland and sacred landscape since countless centuries. Of the thirty-four deity hills that Todas recognise as abodes of specific gods, over one dozen are located in and around the Mukurti N.P.

Values embedded in the Toda psyche ensure that some waters are so sacred that a priest alone may touch them; certain rocks so hallowed that even the most modern of Todas would never dream of treading upon them; and some plants so holy that only an ordained priest of the appropriate degree of ritual purity may dare to handle them. A low population structure (around 1450) has enabled the Toda people to be just one simple link in the web of life.

Toda artistic skills, such as traditional embroidery and architecture, have been inspired by nature. The fact that Toda embroidery represents a unique art form has now been acknowledged officially, with the Government of India granting it a Geographical Indication (GI) patent. The Toda Nalavaazhvu Sangam (along with the Keystone Foundation) moved the application seeking GI status for Toda embroidery. Todas are able to identify the seasons of a year from the flowering cycles of plants. Also, they have used nature as their inspiration when building their houses, dairy-temples, buffalo pens and churning-sticks. Nature has been treated with reverence as a living entity, being able to denote even our anxiety levels.



## Ecological Changes

Unfortunately the environment has been changed considerably since independence, with once vast areas of virgin grassland now planted with exotic trees like eucalyptus, black wattle and pines to supply raw material to the viscose industries in the plains. Large wetlands have also been inundated by numerous reservoirs to meet the hydroelectric power requirements of Tamil Nadu, while much of the remaining area is now under tea and vegetable cultivation. With the result, the globally significant shola-grassland mosaic is under threat of disappearing altogether unless action is taken to revive both degraded sholas and grasslands. Although shola restoration has begun to be undertaken by the government, there is as yet no move by them to plant grass species in degraded pastures and wetlands. For decades the montane grasslands of the Nilgiris have been treated as wastelands – this attitude is finally changing, but much more needs to be done. The fact that a majority of the floral species that are endemic to the upper Nilgiris are found in the high elevation grasslands, should have established their



Prehistoric Rock art



Kurumba men gathering *Apis dorsata* honey on sheer cliff face

biodiversity value a long while ago. Secondly, recent peat bog studies of plant pollen grains, have established how the Upper Nilgiris looked 40,000 years before the present time. We realise that grasslands have coexisted with sholas for at least forty thousand years. Hence we find the use of the term 'high rainfall grasslands' as annual precipitation can often exceed ten metres.

The Upper Nilgiris gives rise to the major river systems of this area. The Toda homeland, albeit small, provides the plains below with their principal sources of water. Many of these river sources have now been dammed and around a dozen hydroelectric reservoirs have inundated some of the most sacred Toda sites. These reservoirs contribute a major share of Tamil Nadu State's hydroelectric power generation. A significant characteristic of the Western Nilgiri hydrological system is that more or less the entire annual rainfall flows into streams and rivers.

The indigenous groups: Todas and Kotas on the higher reaches, along with Kurumbas and Irulas on the slopes, have occupied the Nilgiris since ancient times. There are a number of

prehistoric sites scattered throughout the hills that could be related either to one or more of the indigenous peoples. These prehistoric sites comprise stone and earthen circles, cists, dolmens, shrines and rock art.



Prehistoric remains - Stone Circle



Traditional Toda dress

### Toda Nalavaazhvu Sangam

The Toda Nalavaazhvu Sangam (Toda Welfare Society/ TNS) is a sister organisation of EBR, and dates back to 1992. This organisation has been instrumental in reviving Toda culture: from the reoccupation of several seasonal hamlets, sometimes after a hiatus of many decades; the rebuilding of a number of very sacred dairy-temples; the revival of traditional barrel-vaulted housing; promotion of traditional art forms like the embroidery performed by Toda women – the TNS obtained the prestigious Geographical Indication (GI) patent from the Government of India a few years ago; to more mundane necessities like facilitating the provision of basic amenities like electricity at remote hamlets, footpaths, water supply, buffalo loans, etc by the district administration, and raising funds for medical exigencies as well as for educational support and other welfare schemes.



Toda Embroidered products

### EBR Centre Trust

The Edhkwelynawd Botanical Refuge (EBR) Centre Trust was established more recently with the hope of achieving a synthesis of objectives. Among the more important of these are:

- (a) To restore the original ecology in a degraded zone surrounded by areas of high biodiversity,
- (b) To propagate the plant species crucial to the Todas,
- (c) To reintroduce and propagate the endangered flora of the Nilgiris,
- (d) To prevent further degradation and encroachment onto the adjacent hinterland,
- (e) The protection and preservation of all the mammals, birds and amphibians of the area, including the Toda buffalo, which is a breed restricted to the Nilgiris district and
- (f) To establish a botanical documentation and ecological research centre. This would have live, seed, herbarium, photographic and illustrative records of the rare, endemic and endangered flora of this area.



Todas engaged in ecological restoration at EBR

The EBR Centre Trust has acquired – largely through funding from IUCN-NL – around twenty-four acres of land (mostly tea plantation) in the extremely biodiverse Kundah area of the Upper Nilgiris that borders the core area of the NBR. This along with adjacent tracts of private land that are proposed to be acquired in due course is being restored to its original shola-grassland-wetland ecotypes. EBR has a plant nursery where saplings/ seedlings/grasses are being raised for

in situ plantation on the acquired tract. Tea bushes and other weeds have been removed from a portion of the land and native flora has been planted. However, a majority of the EBR land still needs to be restored, and at the moment, we have erected a solar fence (since grazing from herbivores like Sambar and Mouse Deer is a major challenge initially) and the weeding followed by planting of native tree saplings, shrubs and grasses has been undertaken.



The EBR landscape showing the central area that is being ecologically restored.





*Arisaema translucens*: a recently rediscovered endemic species of cobra lily.

## Project Activities

EBR has been conducting ecological research and botanical studies for a number of years. Several scientific papers on our experiences with Restoration Ecology, floristic species composition of shola forests surrounding the refuge, and studies on nearby wetlands were published by Dr. D. Mohandass. The rediscovery of endangered and endemic species like *Eriochrysis rangacharii* and *Arisaema translucens* in the EBR hinterland were published in international journals and have brought the focus towards conserving and propagating such rare and endemic floral taxa. EBR also documented and described (Nordic Journal of Botany 34: 708-717, December 2016) three new species of endemic wild balsams from the western Upper Nilgiris and gave them Toda-related names based on their sites of location: *Impatiens taihmushkulni*; *Impatiens kawtтыana* and *Impatiens nilgirica* var. *nawtтыana*.

These were discovered as a result of a comprehensive survey of the genus *Impatiens* in the Nilgiris. In fact, the EBR team discovered one more novel species of *Impatiens* from the Nilgiris that was named by a plant taxonomist many years later. Extensive ethnographic and ethnobotanic studies have been undertaken with the indigenous Toda people (*The Toda Landscape: Explorations in Cultural Ecology*; Orient Black Swan and Harvard University Press; Harvard Oriental Series vol.79). Other species like the endemic and endangered *Berberis nilghiriensis* are found to be present in the EBR hinterland and we plan to propagate this along with *Arisaema translucens* and many other rare plants in our nursery before they are reintroduced into the restored areas.

Some other ongoing projects relate to providing support for the preservation of the rich and ancient heritage of the indigenous Toda community, besides also providing medical assistance to these people. Among first societies of the world, Todas are recognised as architects par excellence. It has been hypothesised by scholars that the Toda conical temple 'represents the most primitive Dravidian architectural style' and that it 'appears to represent the prototype of the South Indian temple's vimana'. A project to revive traditional barrel-vaulted Toda houses that have become a veritable symbol of the Nilgiris (ironically, most local people who are proud of this heritage don't appear to care if these houses actually exist) and can be seen in many logos

related to this district, was initiated in the mid-1990s by the TNS, and many of these are still occupied. Realising the need of modern Todas with growing families for more space and durability, we have recently designed a larger barrel-vaulted structure with multiple rooms that has the best of traditional and modern. The prototype is being sponsored by Mr. Aroon Raman who is a close associate of EBR, and is now reaching completion. Meanwhile, ONGC Limited has come forward to sponsor two more such houses and the work on these has begun. We hope that this will lead to the restoration of the traditional look of Toda hamlets in the near future as more such structures are sponsored.

Another project that is underway is the conservation of the Toda breed of buffalo around which the entire cultural edifice of this community is based. The 'Toda buffalo' represents one of the few breeds of the Asiatic water buffalo, *Bubalus bubalis*, and like their masters, is restricted to the Nilgiris. Hence, it is very important



*Impatiens taihmushkulni*: a newly described endemic species of wild balsam



to conserve the purebred Toda buffalo not only for its importance to the Todas, but also for preserving their genetic purity. Earlier, EBR had a partnership with IUCN-NL and Wildlife Trust of India, to breed a pool of buffaloes that were used to compensate Todas who lost their animals to resident predatory tigers. This was done for a few years, until the Forest Department made compensation for such attacks more simplified. Now, EBR has begun a project to breed and conserve purebred Toda buffaloes and it is being funded by Mr. Piero Hug from Switzerland. Despite their well-known ferocity and potentially lethal, crescent-shaped horns, Todas are able to control and communicate with them wonderfully. Todas believe that their distinct buffaloes were created by their pre-eminent goddess Taihhki(r)shy. One of the first sights shown to a child at his naming ceremony is that of the sacred buffalo herd belonging to his clan.

Today, the herd size of both sacred and domestic buffaloes has shrunk



This Toda buffalo breed is confined to the Nilgiris.

### Some of the projects that require support are:

- Ecological Restoration on the acquired land: costs around INR100,000/- per month including salaries.
- Purchase of contiguous land around the EBR site for Ecological Restoration: cost INR550,000/- per acre, inclusive of registration and legal fees. The donor could either contribute this amount to EBR or register it in her/his name, as long as it is committed for nature rehabilitation and that no construction will come up on the land.
- Toda Barrel-vaulted housing: the cost of a synthesised house with multiple rooms is around INR850000/-. A single-room completely traditional barrel-vault house costs around INR150,000/-.
- Toda education: for modern education, the fees vary according to the course of study, but typically range from INR40000/- to 80000/- per annum. For conducting programmes where Toda elders disseminate traditional knowledge to the next generation, this project of great importance could be done for around INR100,000/- annually.
- Establishment of a Field Station at the EBR site: this will have a herbarium and information centre that highlights not only the biodiversity of the Kundah range and the Nilgiris in general, but also covers aspects of Toda culture and ecological knowledge. It will also have a small office space, storeroom, room for researchers, volunteers or guests to stay, and kitchen. The cost will depend on the design and ranges from INR10,00,000/- upwards. Smaller contributions will allow the structure to be erected in stages.
- Medical support to Todas: we typically receive appeals for such exigencies and if the amount involved is small, provide an interim sum. If it involves a major operation, we collect contributions from well wishers in the name of the concerned hospital, and forward it. We realise that it might be better to have a corpus for this from which only the interest could be utilised.
- Support for traditional Toda culture: this was the basic reason for establishing TNS, and EBR is also participating in the revival of Toda heritage. Here too, it would be prudent to have a corpus from which the interest accrued can be utilised.



dramatically and if immediate steps are not taken to propagate the purebred animals and increase the population, it is feared that the Toda culture that dates back to ancient times, might collapse, as without their sacred herds, they will be unable to operate their dairy-temples. Hence this project is the most important need if Toda culture is to survive and thrive, and also to save a distinct buffalo breed from extinction.

In recent years, people from the orthodox Toda community have finally begun to pursue modern education even at the university level. EBR has been in the forefront with support to

young Todas to pursue their dreams. At present, we have obtained full scholarship for several Todas to study at well known boarding schools in the Nilgiris, where they are studying alongside other kids from affluent backgrounds. At the university level, we are, for instance, at present supporting (from donations by well-wishers) the education of Todas who are destined to become the first lawyer, some of the first nurses, teachers and engineers from their community. We have also obtained part sponsorship for other students who are studying in local schools as day students.

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EBR has a website ([www.ebr.org.in](http://www.ebr.org.in)) that is now being revamped to make it more informative and interactive. The EBR Centre Trust is registered under the Foreign Contribution Regulation Act (FCRA) and is allowed by the Ministry of Home Affairs, New Delhi to receive funds from overseas. It is also registered with the Indian Income Tax Department so that all contributions from within India are tax exempt.

Contributions can be in the form of a cheque made in favour of the Edhkwelynawd Botanical Refuge Centre Trust (c/o Dental Clinic, Hospital Road, Ootacamund-643001, Nilgiris) or can be wired directly to the bank account. For contributions from within India, Savings accounts at: Indian Overseas Bank, Ooty Branch; IFSC: IOBA0000786; Ac no: 078601000013565 and Axis Bank, Ooty Branch; IFSC: UTIB0000182; Ac no: 182010100067838.

For contributions wired from outside India: Edhkwelynawd Botanical Refuge Centre Trust, Axis Bank Limited, 1095 Vigneshwar Cresta, Coimbatore, India. SWIFT Code: AXISINBB090 with request to forward to Axis Bank, Ootacamund. Account: 910010014089353.

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### **Major Donors:**

India Environment Trust, U.K. and  
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