

How to restore a rainforest with a nursery, science and some bat poop

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A degraded rainforest site (left) in 2004, from where invasive weeds have been cleared in preparation for restoration, and the same site in 2018, showing some recovery (right) | NCF

Bengaluru: As awareness spreads about the [ongoing climate crisis](#), there are increasing calls to plant trees. Not just that, the right kind of trees need to be planted in the right kind of habitat to encourage the right kind of biodiversity so forests can thrive.

Natural resources like [rainforests](#) play a major role in offsetting carbon dioxide emissions, carbon sequestration, and even regulating the weather.

The relationships that exist between the animals inhabiting a forest and its trees are the primary reason why a rainforest thrives.

For instance, frugivores like some bats species, hornbills and orangutans eat fruits and excrete undigested seeds on the forest floor. [Studies](#) have shown that germination is easier to achieve when seeds are dispersed after they have passed through the digestive tracts of such animals.

Also, seed dispersal by such animals is an important function — seeds dispersed away from the parent plant reduces competition for nutrients, water and sunlight and allows the progeny to thrive.

This is just one example of the kind of relationship that exists between the various inhabitants of a rainforest. It is a relationship that has evolved over millions of years and this is precisely why growing a rainforest in one lifetime is impossible.

At best, science can help you try.

Indian rainforests

Understanding the layers each rainforest comprises — the forest floor, the understory and the canopy — and the fact that seed germination depends on dispersal patterns effected by local wildlife, helped a group of wildlife biologists and nature conservationists from the Mysuru-based Nature Conservation Foundation succeed in restoring a degraded patch of tropical rainforests in the Anamalai Hills of the Western Ghats.

Their work focused on the Valparai plateau, which hosts large tea, coffee, and cardamom plantations occupying around 220 sq km. “The Valparai plateau is located within the Anamalai Tiger Reserve and, about a century ago, the region was deforested and converted to plantations,” Srinivasan Kasinathan, a member of the restoration team, said.

Today, rainforests in the plateau are restricted to about 45 separate patches that are mostly located on lands owned by private companies engaged in tea and coffee plantations.

The rest of the rainforest is intact across the Anamalai Tiger Reserve in Tamil Nadu and Parambikulam Tiger Reserve and Vazhachal Reserved Forest in Kerala that surround the plateau.

“Many wildlife species from the surrounding forests use the patches to move around but these patches are degraded,” Kasinathan said.

So, the team set out to tackle the twin issues of forest degradation and habitat fragmentation caused by the expansion of plantations in the region.

In a landscape that is a mosaic of plantations and rainforests, the participation of plantation companies was crucial, and it came.

“We began a partnership with Hindustan Unilever Ltd in 2001, after a dialogue with several managers to get them interested in conservation,” T.R. Shankar Raman, who started the restoration project along with fellow conservationist Divya Mudappa, said. The company sold its tea plantations to Tea Estates India Ltd in 2006, but the team continued its restoration efforts by forging a relationship with the new owners.

Building an Indian rainforest

Partnerships were forged with Parry Agro Industries Ltd and Tata Coffee Ltd in 2004 and 2005, respectively, and they continue to this day.

The companies engage in forest protection activities over 35 patches, including rainforest restoration and native shade tree use at plantations, and other conservation efforts.

The team began its mission by identifying about 100 hectares of degraded patches on private lands owned largely by the companies engaged in tea and coffee plantations.

The first step towards restoration involved the removal of invasive weeds like lantana and collection of seeds from a diverse set of local rainforest tree species.



Native tree seeds collected from roadsides and forest edges are planted in a rainforest nursery | NCF

“We collected seeds from the edges of forests, along roads and forest trails,” Kasinathan said. Seeds from these areas were chosen, he added, because the possibility of them germinating naturally was relatively lower than those deep inside the forests.

Some of the seeds collected were those that had been excreted by bats. “The seeds we collected from bat roosts had a very good germination success rate,” Kshama Bhat, another team member, said.

On average, Bhat said, their nursery holds about 180-190 seed varieties that comprise shrubs and small to medium-sized trees that together form the understory of the rainforest as well as larger, richer trees for the canopy. There are also climber species like lianas.

These seeds were then allowed to grow in the nursery for two to four years, after which the saplings were planted in the degraded patches and monitored for about two-three years.



Young trees are raised for up to three years in the rainforest nursery before they are ready for translocation to restoration sites. | NCF

Raman said the older sites among the patches have recovered and, now, the team is only focusing on carrying out maintenance activities like weeding in these areas. Meanwhile, active restoration is still being carried out at other sites, he added.

In addition to this, over 1,075 hectares of additional private land were identified for passive restoration where efforts were focused on preventing tree felling and further degradation.

“In essence, the companies agreed in principle to retain these plots as forests,” team member Anand Osuri said. “We don’t intervene actively in these areas. We protect the area and allow nature to take its course.”



A mix of nursery-raised tree saplings is planted at a restoration site. | NCF

The success of the restoration effort sounds promising, but Osuri sounded a note of caution.

“Restoration cannot be used as a crutch... We cannot say that clearing existing rainforests is ok because restoration is possible,” Osuri said. “Restoration is not a solution for deforestation.”

Source: <https://theprint.in/environment/how-to-restore-a-rainforest-with-a-nursery-science-and-some-bat-poop/359428/>