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PALANI HILLS

Plantation paradox

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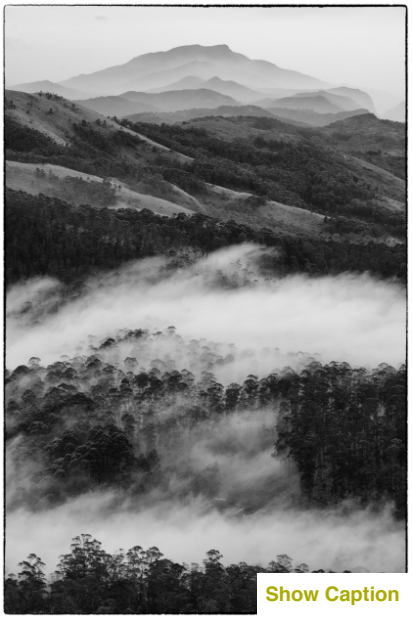

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The dilemma and complications of non-native timber plantations in the Palani Hills. Text & photographs by IAN LOCKWOOD

IN recent weeks there has been a movement among the courts in Tamil Nadu to address issues relating to shola ecology, its restoration and the role of non-native plantations. This follows litigation last year that asked why the Tamil Nadu Forest Department was not removing non-native tree plantations in areas that once hosted shola/grassland mosaic ecosystems. While getting the judiciary to support conservation efforts in the Western Ghats is welcome, these cases may, in fact, complicate and set conservation back for a variety of reasons. Non-native timber plantations in the southern Western Ghats ranges play a complex role in the montane ecology, and well-intentioned but misguided responses to their presence over large areas of the landscape will potentially set conservation in the hills backwards. It may seem like a contradictory approach for conservationists to actually support these alien plantations, but a close inspection of the facts should shed light on the complexity of the situation in the Palani Hills and other high ranges of the southern Western Ghats. This article explores the paradoxical role of non-native timber plantations and the dynamics of restoration efforts in the higher elevations of the southern Western Ghats. The insights are based on very personal experiences of four generations of the author's family walking in, observing, learning about and documenting the landscapes and ecology of the Palani Hills.

The Western Ghats context

The Western Ghats are widely acknowledged for their high levels of biodiversity, stunning landscapes and role in shaping the monsoon's interaction with peninsular India. The Ghats are a natural treasure trove and play a crucial role for millions of people in peninsular India who benefit from water and other natural capital in the range. Biodiversity in the Western Ghats includes species diversity (the range of species in the 1,600-km-long chain), the genetic diversity (variation of genes within single species) and habitat diversity (in the complex, heterogeneous range of land forms). Conservationists in India have been concerned with the whole Western Ghats range for many years. The Silent Valley campaign in Kerala in the 1970s was a landmark event that catalysed public awareness in a debate between "development" projects (a hydroelectric dam) and fragile, ecologically rich rainforest landscapes. The intervention of the Central government led by Indira Gandhi in favour of protecting Silent Valley was a rare win for the nascent post-Independence conservation movement. Since then, there has been steady conservation progress, but this has been overshadowed by increasing pressure from mining, infrastructure projects, tourism and expanding human populations. There is a string of protected areas (P.As) up and down the range from the Tapti river all the way down to Kanyakumari. However, many important and vulnerable landscapes, including timber plantations, are found outside these P.As.

In 1998, Conservation International designated the Western Ghats (and Sri Lanka) as one of the world's 25 biodiversity hotspots

(there are now 35 recognised hotspots). This designation for the area was elevated to place it among the world's eight "hottest of the hotspots". This is *not* a badge of honour to brag about, and what it means is that though there is exceptional biological diversity, the area is under severe strain from anthropogenic forces. In July 2012, the Western Ghats became a UNESCO World Heritage Site, which further turned the spotlight on the area. Within India, two recent exhaustive studies commissioned by the Central government (the Madhav Gadgil-chaired Western Ghats Ecology Expert Panel (WGEEP) in 2011 and the Kasturirangan Committee in 2013) have drawn attention to the area. The Kasturirangan report is widely viewed as a milder, "watered- down" version of the WGEEP report with efforts to balance "development" needs with conservation. The findings and suggested remedies of both reports have become the subject of a vicious political debate in several States. What is clear is that there are a variety of entrenched players who have an interest in maintaining the status quo and allowing various harmful activities to happen in these areas. Opportunities to generate crores of rupees from timber plantations in the Western Ghats constitute one such interest that views conservation and restoration efforts as obstacles.

Shola/grassland mosaic

The southern Western Ghats include areas from the Nilgiris southwards to the Anamalai, Palani Hills and High Range, and then further south they host the highest mountains in the entire mountain range. These hill ranges historically hosted a complex mix of vegetation types that were dependent on morphology (slope, etc.), rainfall levels, soil type, altitude and proximity to the western coast (which is wetter). The shola/grassland mosaic systems were once found on the lofty plateaus and their steep slopes. The high plateaus of the Nilgiris and Palanis and places like Eravikulam National Park average about 2,000 metres in height, but the shola/grassland mosaic is considered to start as low as 1,500 metres. The shola/grassland mosaic is composed of small patches of montane evergreen forests (sholas) interspersed by expansive areas of high-altitude grasslands. The word shola, roughly translated as "thicket or grove" in Tamil, is used loosely to describe forest patches of montane evergreen forests. Sholas, like other cloud forests in tropical highlands, are diverse and host a variety of stunted tree species, shrubs, lianas, a variety of mosses and epiphytes. Because of frost and sometimes fire, shola species have difficulty spreading from their edges into the grasslands. In the last century, there has been debate about the origins of the mosaic (is it human influenced or natural?), which is a related issue but one that deserves separate space. Ecologists recognise that the high-altitude mountain landscapes of the Western Ghats have been affected by significant natural forces, including natural climate change, swings in temperatures and seasons of drought. There is now widespread agreement among ecologists that the shola/grassland mosaic is the climax vegetation type of the montane areas of the southern hill ranges.

The rise of timber plantations

When south India's hill areas were first settled by Europeans in the early 19th century, the montane landscape looked very different from what we now find around the towns of Ooty (Udhagamandalam), Kodaikanal and other similar altitude hill stations. Early images of the Nilgiris and the Palani Hills reveal large downs of grasslands with clumps of sholas and a few scattered houses. There were several challenges that the landscape posed to early visitors. To begin with, there was limited firewood available (shola wood was damp and made poor carpentry material or combustible fuel). Early visitors may have wanted shade, and shola trees grow slowly. The answer to this was to import fast-growing non-native tree species. Australian eucalyptus (mainly *E. globulus*) was introduced in the Nilgiris in the early 19th century and was favoured for its fast growth and high uptake of water in marshy areas. In 1852, just seven years after the first bungalows appeared, eucalyptus was introduced in the Kodaikanal basin by Major Partridge from the Bombay Army. In subsequent years, pine (*Pinus patula*) from Mexico and Australian wattle (*Acacia mearnsii*) were also introduced into the hills. The rolling downs of grasslands around the settlement areas were soon replaced by plantation species, something that is evident when one looks at early photographs of the hills. Interestingly, the outlying hills of the Palanis remained unplanted into the mid-20th century. The pattern was similar in Ooty but predated the Palani Hills planting because of Ooty's importance as the summer seat of the Madras Presidency. One of Ooty's earliest plantations still stands at Cairn Hill, though after several generations it has seen shola species creeping back into its edges. Along with tree species, a whole host of other shrubs, weeds, grasses and even fungi were introduced either intentionally or by accident. All of these non-native or exotic species are so ubiquitous in hill station gardens and landscapes that very few visitors and residents are able to distinguish between native and non-native vegetation.

The change in the landscape of the high hills of southern India happened with relatively little alarm from civil society. The exceptions were hunting and wildlife associations that kept some areas, such as the Kundahs (Mukkurthi) in the Nilgiris and the Eravikulam plateau in the High Range, free of plantation. The process of widespread tree plantation began in colonial times. However, in the remote areas of the Palani Hills, much of the replacement of grasslands happened in the post-Independence years. We know this from photographic and satellite evidence of the hills from as recently as the 1970s and now. For many years, the Forest Department categorised montane grassland as "wasteland". This is still apparent on contemporary land cover maps from official government agencies. The idea of grassland as "wasteland" seems to have been an invitation for montane grasslands to be experimented with for afforestation schemes and agricultural extension. During the same time, most of the sholas in the Palani Hills survived the plantation drive and they were largely left alone. This played a key role in the unexpected changes that we now see.

A growing consciousness

In the 1980s, there were widespread global concerns about deforestation in the Amazon and other large forest areas. In more recent years, the issue of climate change has further contributed to an interest in maintaining and increasing tree cover. The Chipko Movement in India's Garhwal Himalayas in the 1970s had already raised consciousness about the ecological value of trees in India. Further south, in the Western Ghats, lowland forests were being felled, and this soon became the subject of environmental campaigns such as the Silent Valley movement. However, in the higher reaches the problem was that trees *not* native to the area were replacing montane grasslands. On paper, and in official statistics, this contributed to a net *increase* in forest cover. Thus, the shola/grassland mosaic and the negative impacts of its conversion to plantations posed a challenge to the narrative of planting trees as an end-all

solution to deforestation.

Until very recently, the Forest Department in the southern States continued to treat montane grasslands as optimal sites for afforestation projects. For one thing, they were categorised as "wasteland" and perhaps vulnerable to illegal encroachment (it is easer to delineate and protect a reserve forest if it had forest rather than grassland on it). In the 1990s, this author observed the continued planting on undisturbed montane grasslands in the Palani Hills with the usual suspects (eucalyptus, pine and wattle). As awareness of shola biodiversity expanded, the Forest Department followed the lead of non-governmental organisations (NGOs) and established shola nurseries for propagation. Shola saplings are vulnerable to winter frost and their propagation is a more delicate process than raising non-native plantations. Sholas, the cloud forests of India, are now widely recognised for their value of harbouring biodiversity. The recent court cases base their arguments on this fact, but most people seem to forget that sholas are part of a mosaic that includes montane grasslands.

Concern about disappearing montane grasslands in the Palani Hills was raised by the Palani Hills Conservation Council (PHCC) after it was founded in 1985. This civil society group did pioneering work with shola nurseries and in popularising the planting of native tree species. Major figures from the wider Indian conservation movement, such as Zafar Futehally, Fr Matthew, Rom and Zai Whitaker, Rauf Ali, Pippa Mukherjee, several notable Aurovillians and others, were involved in the new group. The PHCC members and ex-employees have gone on to be involved with major Indian environmental groups such as ATREE (Ashoka for Research in Ecology and the Environment) and the BNHS (Bombay Natural History Society). In the last 20 years, the Vattakanal Conservation Trust (VCT), also based in Kodaikanal, has become the most knowledgeable NGO dealing with shola/grassland ecology and restoration. It has collaborated with the Tamil Nadu Forest Department on shola restoration, documented the diversity of shola plant species, worked with other restoration groups (Nature Conservation Foundation, Gurukula Botanical Sanctuary, etc.) and piloted a pioneering grasslands watershed study. In particular, the VCT has led the way with ecological restoration efforts in the high southern Western Ghats.

Alarming developments, distressing responses

In the Palani Hills, montane grasslands have been dramatically reduced in the last few decades. Analysis of Landsat satellite imagery from 1973 (when the first images are available) and 2014 shows a clear change in land cover in the high plateau area from Moyer's Point west to Berijam Lake and Vandaravu on the border with Kerala. The thermal images depict areas that were once the warm colour of dried grass not photosynthesising (in 1973) being converted to dark hues of thick forest (in 2014). The satellite imagery is supported by terrestrial photographs showing dramatic changes in the landscape. The landscape in this western region of the Palani Hills is dominated by non-native plantations. However, what is interesting is that the sholas that were interspersed by the original grasslands were left alone, and they have survived the changes. In fact, the most surprising development is that where there are sholas they have spread into neighbouring plantations. This is the fact that confuses and complicates the rush to remove plantations.

Timber plantations in the upper Palani Hills and the other ranges of the southern Western Ghats now support a mix of non-native and indigenous species. In effect, the plantations have become nurseries for a diversity of shola species! In some cases, 30-year-old plantations have shola species that are at a mature level and set to overwhelm the non-natives. Field studies by TERI University, New Delhi, have found up to 200 different shola species, including orchids and endangered species, in plantations in the Palani Hills. This shola invasion of plantations is documented for all the major exotic species in the Palani Hills. From a biodiversity point of view, this is excellent news as these mixed plantations are home to a wide variety of plants, birds, animals and other species. To be clear, the hybrid landscape is very different from the grasslands mosaic that once occupied the area. But it is also a significant improvement, illustrating the resilience of natural systems, on the monoculture plantations that were put in three to four decades ago.

The problem with cutting down non-native plantation trees is that when this is done it is often counterproductive. The preferred method of plantation harvesting is clear-cutting over swathes of hills. While some shola saplings (usually pioneers such as *Daphniphyllum* species) are spared, the area is vulnerable to being overrun by weeds such as *Eupatorium odoratumas* and wattle. Studies and observations suggest that disturbance on this scale leads to regrowth of unwanted plantation species and a critical decrease in soil moisture.

In other words, it is not as if removing plantation trees magically returns the landscape to the shola/grassland mosaic that we know from historical images of the same area. Clearing plantations using the clear-cut method leads to regrowth of all the *wrong* species and a decline in diversity. Several cleared plantations near Berijam Lake are now crowded with weeds, wattle and pine saplings. In mature plantations, the wattle seems to be dying a natural death from fungal attacks and old age, as documented in numerous cases by the VCT. The implication here is that the exotics will eventually die out and be replaced by shola species in a major plantation area—if they are left alone.

A way forward

Among NGOs, ecologists and members of the Forest Department, there is now agreement about what to do to avert further disaster in the Palani Hills and other ranges with mixed plantation and shola species.

- Protect and restore existing montane grasslands. In the Palani Hills, there are very few large areas of surviving montane grasslands. After several years of surveying the hills, the author has seen numerous areas ripe for grassland restoration. Perumal Peak, the distinguished symbol of the hills, has thin lines of eucalyptus mixed with significant patches of montane grasslands (planted in the 1980s). Careful restoration work, including clearing of non-native timber with attention to grasslands' health, could be conducted here. The southern escarpment edge of the Palanis, with some of the grandest landscapes in the Western Ghats, hosts important patches of grasslands and is home to populations of the Nilgiri tahr. This is a second example of an area in need of grasslands restoration ("Breathing life back into the sholas", Frontline, April 20, 2012). The VCT has identified a lot of other potential

restoration sites.

- Consider the complex ecology in any move to remove plantations and recognise them as nurseries of sholas. Many plantations are at a mature state of shola revival, and it needs to be accepted that these will revert to sholas if left alone. Mixed plantations could be gradually thinned—thus continuing to provide firewood and jobs for mountain communities.
- At the moment, it is likely that potential revenue, not conservation ideals, is the motivation behind plantation clearing and litigation to force the Forest Department to clear more.
- Work with NGOs and civil society groups that have developed a unique expertise in and understanding of the dynamics of the ecology, plantation and restoration in the southern Western Ghats. Several individuals in the region have been enthusiastic about this, but institutionally the Forest Department has been slow to recognise the valuable work done by citizens.

The Palani Hills, like other similar hill ranges in the Western Ghats, are poised at a crucial point in time. We now have a much better understanding of the complex dynamics of the shola/grassland and plantation ecology. We understand what the landscape once looked like and what it hosts in hybrid plantation-sholas. And we know what can happen in the future if this evidence is not worked into decision-making. There are other issues not explored in the article such as the relentless expansion of the Kodaikanal township, the significant solid waste management problem, the Ponds/Unilever mercury contamination issue, the hydrological crises in the hills and the challenges faced by unsustainable numbers of visitors. The shola/grasslands/plantation issue in the Palani Hills is one that can be addressed by a shared understanding of plantations, their complicated dynamics, a thorough application of ecological restoration and an urgent effort to protect any remaining montane grasslands.

Ian Lockwood is an educator, writer and photographer who lives and works in Sri Lanka. He has a lifelong association with the Palani Hills. This article is part of a series in Frontline *and was written after numerous field visits and interactions with a variety of experts and ecologists concerned with the southern Western Ghats.*

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