

## Deforestation: The View from South India\*

Bret Wallach

Much attention has been paid in recent years to the endangered rain forests of the world; much less attention has been paid to the forests of the seasonally dry tropics. There, unlike in the primeval rain forests, vegetation has been so altered by human beings that pleas for ecosystem preservation seem like a bad joke. These forests cannot match their wetter cousins for genetic diversity or biomass production, but it is here in the seasonally dry tropics that millions of peasant farmers depend upon the forest for survival, and it is here that forest cover restoration seems most hopeless.

I am neither a botanist nor a forester; my qualifications are doubly peripheral, in fact, for I speak as someone who spent eight months of 1982 looking not at forests but at irrigation projects in South India. For me, forests were a sideline, noticed in the course of traveling between irrigation works. Yet two years later, my memories of South India's forests are still vivid and speak as a metaphor for the country's wider problems.

The precise boundaries of the "administrative forests" of India appear in the *Forest Atlas of India*, published by the National Atlas Organization in 1976. This atlas shows many things but not the one essential thing. It shows, for example, the estimated value of India's forest products. It also distinguishes the types of forests in India: semi-evergreen forests, for example, along the high western edge of the peninsular plateau; or thorn forests in the rain shadow to the east; or deciduous forests in the ridges that rise from the South Indian plateau close to the Bay of Bengal.

In all this rich compendium, however, there is not a single map showing how much wood fiber actually stands on the ground. Perhaps it is just as well, for if an effort were made to produce such a map, we would probably get a falsely comforting document, a blend of guesses biased to fit the expectations of whoever had ordered the survey. The sad fact is that large areas administered as forests are barren, while the areas not reserved or protected as forests are almost surely in crops or grazed. Perhaps three-quarters of the forests that once covered South India are gone. Statistics aside, visual impressions of even a casual observer of South India are clear and damning; the situation is grave.

*Forests without Trees.* Imagine the great triangular peninsula of India: its base is squarely astride the Tropic of Cancer, from which the peninsula hangs down to within eight degrees of the Equator. If this triangle was a square, it would measure 800 miles on a side. In general it is tilted, so that the great rivers of

South India all start close to the west coast and flow east across almost the entirety of the peninsula.

In the western highlands of this triangle, nine feet of rain pour down within the few summer months of the monsoon, and there is plenty of warmth for plant growth. The Forest Atlas shows the summit of these hills--east of Bombay, 3,000 feet above sea level--in bright green, the designated color for reserved forest. Years ago, however, the forests here were cut for locomotive fuel and probably for urban markets; they are kept down today by villagers trespassing in search of fuel and fodder.

This is especially true along the country's railways, but conditions are not much better elsewhere. You can visit Mahabaleshwar, for example, a famous old town that in the days of the British was a retreat from the heat of Bombay. The British protected this bit of ground with special zeal. Since India's independence in 1947 their bungalows have been taken over by Indians probably equally determined to preserve the forests. The neighborhood is still laced with roads leading to rustic bungalows and with bridle paths laid out for recreation. Yet the paths lead through scrub woods scarcely tall enough to shade a rider.

In an effort to find some approximately virgin South Indian forest, I arranged a trip into the watershed of the Koyna Reservoir, built in the 1960s to provide hydropower for Bombay. Local forest officers took me by motor launch far from any road and into the upper reaches of the dark blue lake. Unlike most reservoirs of the peninsula, Koyna was in no danger of silting up.

We went ashore and walked up a steep path to the summit, where there was a clear view westward to the coastal lowlands. The slope we climbed was luxuriantly wooded, the first real forest I had seen in traversing the peninsula at this latitude. At the top of the hill, however, and at the edge of the reservoir catchment, the view was surprising. There ought to have been an even wetter forest along the west-facing slopes, one dripping in vines. After all, this slope faced the monsoon head on. What actually existed, however, was grass, along with occasional euphorbias. Technically, this was an "unclassed forest," but four years out of five grass grows. In the fifth year, lowland villagers climb these slopes, burn them, and seed a crop of millet. Trees don't survive this regime. Looking to the east, you find that the watershed forest is replaced in that direction by terraces on steep slopes. In the wet season, these terraces support unirrigated, or upland, rice.

Farther east, the monsoon rains dwindle to 30 inches a year. Despite the relative aridity--remember that temperatures here are high--high-quality trees can grow here: They include teak (*Tectona grandis*) and blackwood, an Indian ironwood (*Hardwickia binata*). That is the theory, at any rate. The unfortunate fact, however, is that there is virtually no forest left in the area bounded, say,

by Poona, Hyderabad, and Bangalore; one has to go farther east to find teak, for example in the northern part of the Eastern Ghats, those eastern ridges clad also in bamboo.

Over most of the central peninsula, there are instead only two landscapes to choose from: level plains of black soil, cultivated largely in cotton and sorghum, and to the east, a rougher country of red soils, sandy instead of clayey, but blessed with irrigation sources that permit patches of emerald-green paddy.

In this area one sees mangoes here and there: valuable trees indeed. One sees occasional thickets of an acacia (*A. arabica*) whose wood is used for tools and carts. There are roadside lines of toddy palms (*Borassus flabellifer*) in the east and, over a wider area, lines of savagely lopped tamarinds (*Tamarindus indica*) and neems (*Melia azadirachta*). In a way, the landscape is more depressing than one lacking any trees at all, for it hints at what might be.

Is it possible to drive for an hour on any highway of South India and *not* see women and children carrying headloads of branches, often for miles? I doubt it. Even a university campus is treated mercilessly. At Osmania University in Hyderabad, industrious young men climb the trees growing along the campus roads. They cut branches for bullock fodder--the cattle population of Hyderabad is very large--which leaves the university horticulturist near tears.

At the edge of campus and stretching eastward for many miles, the dominant woody plant is mesquite (*Prosopis juliflora*), spread by cattle and now a major pest invading fields and rooting in the small earth dams so vital to paddy irrigation. Mesquite came to India from Jamaica in 1884 with a note explaining that these seeds would grow into hardy trees 40 to 60 feet tall. By 1913, an official publication admitted that in India the "tree" grew instead into a "large straggling bush with bramble-like shoots." The author suggested that India cease looking for salvation in exotics and turn to developing its native species.

Today, farmers work to keep mesquite out of their fields. The stem must be cut, buried under a heap of rice hulls, and burned. Yet the severity of fuel wood shortages in the country is so great that the same mesquite is widely planted by forest departments, whose officers call mesquite "the only remedy" left to them on the severely degraded sites they work with. What else, they ask, is hardy enough to survive? Mesquite, after all, is a good fuel, and despite its fierce thorns it is collected and sold on a large scale. Fifty pounds of branches are worth about a day's wage even in relatively small towns, far from major cities.

Many forest officers are earnestly committed to doing the best job they can. One forester in Shimoga District, north of Mysore, showed me the handsome reserve he was charged with protecting. Smuggling of sandalwood was a major

problem, he said, because the wood was so valuable that smugglers operating by automobile took the wood to oil mills hundreds of miles away. He himself had only recently left the hospital to which he had been sent with broken ribs after trying to stop a gang of thieves driving a hundred cartloads of illegally cut wood. He said that such personal attacks were common.

Smuggling is a well-organized business in some areas. In the state of Andhra Pradesh, for example, gangs of women carry out head loads of branches; any forest officer who dares to arrest them is charged with sexual harassment. One recent study estimates that more than 100,000 tons of fuel wood annually finds its way to the city of Hyderabad alone. The study reports that only a tenth of that quantity can be accounted for in official sales of firewood from the reserved forests. The study concludes that the bulk of the wood comes from private lands, but I would suggest that another way to explain the discrepancy is to acknowledge that the official statistics of firewood taken from the reserves are gross underestimates, masking wholesale trespass.

In neighboring Maharashtra, the forest department writes that illicit cutting of wood is "universal" and says that every effort to control grazing on forest lands is seen by villagers "as an interference with their grazing rights." The villager, the department continues, "grabs every opportunity to graze his cattle the moment the protective staff's back is turned."

*An Age-Old Problem.* The key to this appalling situation, I think, lies in the traditional division of the country into villages. India is divided into states, then subdivided into districts, subdistricts, and, finally, villages. Americans are apt to think of villages as small aggregations of buildings. In India, however, the village is a territory, not only with buildings, but also with surrounding lands that include privately owned fields and public grazing lands, which are commons too rough for cultivation. Consequently, almost every square inch of ground in India is part of a village. India is not merely crowded in a demographic sense, then; it is crowded in a jurisdictional one as well, with the territory of each village contiguous with the territory of its neighbors. That's why, if we want to understand why at least three-quarters of the forests of peninsular India have disappeared, we have to begin with the fact that villagers have been cutting wood in their village forever. They have needed it for fuel, for construction, for tools, and for their animals, which eat not only leaves but thin branches.

The recorded history of deforestation goes back at least to the beginning of the 19th century, when the government of Madras appointed a forest conservator in 1806. The position didn't last: Thomas Munro, an otherwise illustrious governor, abolished the position in 1823 in the belief that if timber supplies ran low, the law of supply and demand would stimulate private afforestation. No planting occurred over the next four decades.

The British meanwhile continued building railways and roads. One consequence was an increased ability to reach forests and cut them economically.

By 1860, conditions had deteriorated so much that officers in much of central India were treating teak as an oddity. E.P. Stebbing's authoritative *The Forests of India* ascribes the silting of the great eastern deltas of the Krishna and Godavari rivers to forest clearance hundreds of miles to the west.

Lord Dalhousie, the great modernizing governor-general of the 1850s, saw the threat clearly and brought a German forester, Dietrich Brandis, to India. As India's first inspector-general of forests, Brandis oversaw the implementation of a forest act in 1865; recruitment began the following year for positions in the country's new forest department. Senior positions were reserved for Britishers, while Indians filled the lower ranks as rangers, foresters and forest guards.

Another decade went by, however, until forest reserves began to be set aside on a large scale. Bombay had already created some reserves in the 1860s in the evergreen forests of the Western Ghats; under the Indian Forest Act of 1878 the presidency government went much further, creating over the next generation the essentially modern pattern of forest reserves covering about 30,000 square miles, or a fifth of Bombay's territory.

Madras instituted a similar policy a few years later and by 1911 had set aside 20,000 square miles of forest. Mysore and Hyderabad, the largest native states of South India, soon created reserves and forest departments of their own.

Since the reserved lands were generally claimed by villages, the process of creating reserves was more complex than, for example, in the United States. Surveys had to be completed to identify and often compensate claimants for land taken as reserved forest. The newly reserved areas were then to be put under scientific forestry and cut by private contractors holding leases from the government. That was the theory, at least.

The reserved forests of India, however, began to suffer from timber trespassing almost immediately. Forest guards would send word that villagers were driving their animals into the reserves of a certain district because village fodder resources were exhausted. A skeptical British officer would be sent to investigate; in his report he would confirm that livestock were in the reserve. One wrote that the animals were as thick as "so many bees on a bed of flowers."

The British record is full of comments like one recorded by the director of the Geological Survey of India. R. Bruce Foote came through Bellary District in 1903 and wrote that the ironwood patches he remembered seeing 20 years before were gone, replaced by a "few pollards not fit to be called trees." In the

late 1920s, the Royal Commission on Agriculture described the village lands of the country as "hopelessly overstocked." A report of the same period from Bombay argued that India's grazing lands could be rehabilitated if given a year's rest and then grazed lightly. The authors went on to concede, however, that secure fencing was essential to any such program and that such fencing was "a counsel of perfection." Even then, foresters had become embittered by the hopelessness of the situation: one wrote that forest fires at least were not a problem, since "all the combustible material is consumed by the half-starved cattle." D

*The Search for Solutions.* Today, grazing in reserved forest continues, and the forests continue to be plundered for firewood: Forest officers cannot imagine an end to it.

In many of the dry districts in the center of the peninsula, tree planting efforts have been stimulated in the last few years by the Drought-Prone Area Program, funded in part by the World Bank. In a village near Sholapur, for example, a hundred acres of leucaena have been interplanted with a grass called *Cenchrus*. The plantation is bounded by a rock wall pronged with agave. The wall has been broken here and there by cattle, but the trees seem to be doing well. Headloads of the grass are already being sold at a nickel each, while branches will be cut in a few years. Yet this plantation, like so many demonstration projects in India, is a special case. More often, plantings have been overwhelmed by local villagers before the trees were able to establish themselves.

Many Indian foresters are convinced that the only way the nation can meet its forest-product requirements is through better management of private or village lands. In a way, this proposal coincides with prescriptions in the United States, where small woodlots play a surprisingly large role in the national supply of wood fiber. The calculations of potential harvests can indeed be impressive, but after officers near Poona concluded an energetic presentation of such a solution, they lowered their guard and added: "We are fighting a losing battle; let us admit it."

With that, of course, one is back full circle to the pessimism that is so basic to any discussion of forestry in India. B.B. Vohra, perhaps the most eminent Indian environmentalist, has simply said that his country's land and water problems will "ruin us."

Despair is not restricted to forests. Consider the subject I know best, irrigation. Tremendous amounts of money have been spent on its development in India in the last 50 years, yet the projects fail to deliver water to a very large proportion of the areas they nominally serve. It is an engineering problem in part, but it is also an institutional problem. The projects have been designed to spread water thinly, but farmers at the head ends of the canals take more than

their fair share of project water, leaving "tail-enders" with little or no project water.

An outsider can prescribe penalties for such diversions, but the penalties cannot be collected, or they are waived, or they are so small that the violators pay them and continue to violate the law. An outsider can prescribe a stronger bureaucracy, but the Indian response is that the opportunities for "income supplementation," a fine euphemism for corruption, dwarf even the incentive of higher salaries and in this way thwart any conceivable disciplinary action.

Whether the subject is forestry or irrigation, Indians often resort to a fatalism based on the belief that God alone can solve their problems. Westerners working in the country often find it an irritating attitude but then develop the secular equivalent of that attitude, a belief that India will defy all the expert advice anyone ever offers.

An anecdote will make the point. East of Nizamabad, in hilly country supplying much firewood for Hyderabad, I visited a teak nursery where tens of thousands of seedlings, carefully watered by hand, were growing in plastic bags. The seedlings were to be planted in a nearby reserve protected with barbed-wire fencing strung on granite posts. The seedlings were thrifty, the gardeners thorough, the fencing tight. But in the nearby reserve, fires were burning skyline to skyline, for this was the dry season. The chief conservator of forests blamed cigarettes and reported heavy annual losses. His department, he explained matter-of-factly, had no funds for putting out fires.

\*Revised 2004 but not updated from the version published in *Garden* (9:1) January/February 1985, pp. 8-15.