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Whither giant trees?

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URBAN ECOLOGY

Having trees on the road around a building can reduce AC and cooling costs by as much as 30 pc. A study conducted on ten major conduits with high traffic density in Bangalore showed that surface air temperatures were significantly cooler under the shade of street trees. In an era of increasing climate change, we cannot afford to ignore this data, writes Harini Nagendra



Reeling under the impact of the heat in Bangalore these past few months? You're not the first to complain. As far back as 1868, a fascinating account is provided of sepoy reporting that "in Bangalore, some twenty years ago their fingers were so benumbed with cold on early morning parades, that they found some difficulty in holding their muskets, whereas they cannot now complain of the cold being in any degree unpleasant."

Fortunately, later in the 19th and 20th centuries, planners recognised the need for shade, planting trees that

brightened Bangalore with their vivid blossoms of multiple shades, and screened the city from the worst of the sun's fury. Old planting schemes were dominated by giant trees, each of which could shade as much as half an acre! Sadly, our recent studies indicate that most of these large-growing species are being slowly replaced by smaller-sized, fast growing species. There is even talk of completely phasing out the planting of trees on city roads, and replacing these with shrubs – as many of you can see on some of the city's new arterial roads.

Why should we care? As urban ecologists, we have studied the biodiversity and environmental services provided by Bangalore's street trees, and held a number of discussions with a range of audiences and viewpoints. One discussant expounded a widely held view recently, saying, "Who doesn't like trees? But the fact is that we need roads in the city, more than we need trees." This seems to reflect opinions held by several of the city's planners and policy makers, many of whom say that having trees on streets cannot be an effective argument against road widening, since each tree will be replaced by planting several saplings.

Global studies on street-trees

Opinions on this issue can, and do differ widely. Facts, however, are incontrovertible. Let's therefore take a look at some of the studies around the world that have identified a number of very important reasons to have trees on roads. In harsh city environments, street trees help people stay healthy for a number of reasons. Psychologically, of course, looking at greenery induce a sense of well being. But it is much more than that. Trees reduce asthma, by lowering pollution levels. They help to reduce heatstrokes and the other ill effects of extreme heating. People walk and cycle more on when wooded streets, resulting in greater exercise and reduced obesity. The benefits of street trees don't stop there. They support a vast amount of biodiversity, from noisy capering squirrels to chattering, cheeping birds and gloriously coloured butterflies. They provide opportunities for street vendors, street food, and all the human activity on streets that gives a city its character. Street trees also reduce the likelihood of road accidents, by making drivers more aware of their surroundings. Much of these insights come from other cities. In an effort to understand how much this is actually relevant to Bangalore, we have conducted an assessment of the impact of street trees on pollution and climate. The study itself was quite simple - the results are dramatic, and provide a striking illustration of just how hot and polluted our city is, and the dramatic ability of street trees to make the city more livable.

Study on ten Bangalore roads

We selected ten major conduits with high traffic density - Assaye Road, Bannerghatta Road, Be

Road, ITPL Road, Jeevanbhimanagar Road, Magadi Road, Outer Ring Road (Hennur Junction), Outer Ring Road (Kamakhya), Sarjapur Road, and Siddapura Road. On each of these roads, we compared a 200 meter stretch with and without trees, looking at variations in temperature, humidity, and air pollution levels. Our first study was in August-September 2009, with a follow up study in May-June 2010.

Surface air temperatures were significantly cooler under the shade of street trees. To take an example, on the Outer Ring Road in Banashankari close to Kamakhya, afternoon temperatures went up to 33 C in the shade – under the exposed sun, the temperature climbed to a heatstroke-inducing 38 C. Even worse, while road surface temperatures only reached 35 C in the shade, under the sun road surfaces reached temperatures of 60 C.

Overheated roads contribute greatly to urban heat island effects, taking a long time to cool down, and acting as sources of heat that make the evenings and nights as unbearable as the day. This is

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when you turn on the air-conditioning in your car, or crank up the cooling in your office building. Even a modest reduction of 3 C can cut cooling costs by 10 per cent, and having trees on the road around a building can reduce air conditioning and cooling costs by as much as 30 per cent! Trees also act to increase humidity, by as much as 20 per cent compared to exposed stretches of the same road. Thus, if you find your throats more parched this summer, or your skin more dry than you remember from past years in Bangalore, blame it on the loss of trees!

We found distressingly high levels of air pollution. Perhaps the most important indicator of air pollution is the amount of Suspended Particulate Matter (SPM), small particles of soot, dust and other material suspended in the air, largely due to emissions by road vehicular traffic. High levels of SPM give rise to a number of very serious health issues, from asthma to cardiovascular disease, and even lung cancer. In a majority of the roads we surveyed, SPM levels far exceeded permissible safety limits. On Sarjapur road, for instance SPM levels were four times the permissible limits when there were no trees, but reduced to safety levels with some tree cover!

In an era of increasing climate change, we cannot afford to ignore this data. In the past three years alone, thousands of the city's largest trees have been felled to make way for the Metro, for underpasses and flyovers, and high speed no-signal highways. With plans for widening another 600 km of roads underway, the authorities appear largely indifferent to this issue. Our research indicates that this tree loss is not random but systematic – the streets selected for tree felling contain the city's largest and oldest trees. An unrecognised tragedy, but a tragedy nevertheless! It is shortsighted, even foolish, to think that the environmental services provided by an 80-90 year old tree can be replaced by planting 10 saplings, which will take decades to reach anywhere near the same size or provide the same services.

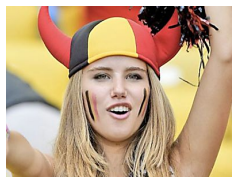
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sriram • 3 years ago
IT is good to know so much technical information about trees, and the advantages of shade they give. the article must also mention what type of trees are studied - some of the shade trees like Rain tree / Gulmohur etc. have tonical roots and brittle wood which

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