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The Sunday Read: Uprooted

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In landscapes dominated by native species of trees, the population of pollinators also stays at a healthy level

By Garima Prasher

Study shows number of native tree species has declined in the city

A study done in Bengaluru has found that the number of native tree species has tailed off in the city, mostly in the northern part. And what is more, the pollution is causing them stress and causing a dip in their population too.

Conducted by the Institute of Wood Science and Technology in association with Georg-August-University, Germany, the study looked at trees along a gradient from the city centre to the rural area in the northern part of Bengaluru. A total of 1,128 trees of 93 tree species were recorded along the study traverse. And among 92 species identified along the gradient, while 53 species were found to be exotic, only 39 were recorded as native.

According to Dr. BN Divakara, senior scientist, Institute of Wood Science and Technology, trees in urban areas are planned as per their aesthetic and ornamental value, leading to higher number of exotic species.

“Trees in Bengaluru are selected and planted by the horticulture department and forestry division. Mostly, exotic tree species are picked up for their ornamental values. Further, the construction of cities and expansion of urban areas also promote the replacement of native species by non-native species. However, in rural areas, trees are selected based on food requirements and religious purposes, resulting in more native species trees,” said Dr Divakara.

Experts say a higher number of non-native trees in the city is a worrisome trend, as they are not just resource intensive; they impact food crops too.

“While exotic species serve aesthetic purposes, many do not provide ecosystem services. Studies have shown

that non-native tree species draw more water for their sustenance leading to water scarcity in the region. While these are ornamental plants in their native habitat, when brought in an urban setup and left to grow under favourable tropical climate, they become invasive and start to swarm over agricultural crops too. Some good cases in point can be Water Hyacinth in aquatic systems and a Parthenium or a lantana in terrestrial systems,” said Dr. TV Ramachandra, Centre for Ecological Sciences, IISc.

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– BN Divakara, Institute of Wood Science & Technology

Native species have medicinal value and most of them provide food to the dependent biota. Moreover, in places with native tree species, availability of water increases, impacting the livelihood of people positively. However, when it comes to a landscape dominated by exotic species, the population of pollinators goes down drastically, impacting the yield and quality of food produced.

“Water availability, round the year, allows farmers to grow multiple crops or cash crops. Moreover, since pollinators get food, they become diverse and abundant in areas with native tree species leading to efficient pollination, thus a higher yield. For instance, in a landscape dominated by exotic species, honey loses its medicinal character. The exotic plants also have flowers with a higher proportion of pollen which poses a threat of respiratory diseases in the region. For instance, Parthenium, an exotic species, causes skin rash,” said Dr. Ramachandra.

According to the study, the dominance of exotic species in the city is gradually replacing native trees towards the transition area and there is a need for striking a balance.

“Decline in tree vegetation and native species indicates the necessity to conserve and increase the existing green spaces in the city. Development of urban corridors for the city will also help in reducing the urban heat island effect,” said Dr. Divakara.

Sustainable urban planning: need of the hour

According to conservationists, tree species in an urban setup should be adaptive. Moreover, appropriate tree and vegetation management practices should be brought in by urban planners to conserve the existing green spaces and contribute towards sustainable urban planning.

“The overall goal of urban planning so far has been to minimize transport distance between areas of residence and areas of work. However, now we are clear that there must be many more goals, including protection of biodiversity, and thus, native tree species. We can do so by making our parks more inclusive of native species and by focusing on tree-based parks as they are not resource intensive. Moreover, the studies by the scientific community should include specific recommendations based on the given urban fabric. Specific suggestions such as which species of native trees should be picked up and where they should be included will go a long way,” said S Vishwanath, urban planner and water conservation expert.

They are stressed too!

Trees in urban areas were found to be taller and larger than the rural trees. On visual analysis, city trees also

appeared in stress with some dead and declining individuals, compared to the trees in rural and transition areas. "In urban areas, the trees grow taller because they are put in compact spaces. They face fierce competition due to the lack of space and higher pollution level. Concretised pavements increase the stress further leading to declining and decaying trees," said Dr Divakara.

Experts say that urban planners should consider various aspects of species selection and tree management while greening the city. Moreover, tree species should be selected based on the air quality index of the region and tolerant species should be planted.

"Those designing the cities have little knowledge about plant science. If you plant a tree on a pavement and concretise the area surrounding it, you are effectively choking the tree. The concrete does not allow root respiration and the tree becomes weaker. Moreover, vehicular pollution aggravates the problem," said Dr. Ramachandra.