Pitfalls of tress planting without understanding ecosystem and people - centred natural climate solutions

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Trans Himalaya, Ladakh (willow and populus plantation in Ladakh). Picture courtesy- Neeraj Mahar

Every year a huge number of saplings are planted across India and world over in the form of campaigns to increase the green cover and as an essential element of global climate policy, because increasing the carbon stored in ecosystems is an important element of climate mitigation strategy.

However, a joint paper by a number of faculty members of various universities, senior members of institutions and environment experts from different countries including the United States, Sweden, Nepal and India, highlights the expense, risk, and damage that poorly designed and hastily implemented tree plantings are imposing on ecosystems and people. Through their paper, “Pitfalls of Tree planting Show Why We Need People Centred Natural Climate Solutions”, they have urged the policy makers to shift their focus to the needs of the rural and indigenous people who manage ecosystems for their livelihoods and can render climate solutions effective.

Forrest Fleischman, assistant professor in the Department of Forest Resources at the University of Minnesota and one of the co-author of the paper told NewsClick, “People-centred climate solutions, which align carbon storage with the interests and needs of local users of natural resources, are the most effective means of storing carbon in nature. Implementing them requires giving local people decision-making power over resource management. Our research in India shows that the current focus on top-down government and corporate led tree planting initiatives is not very effective.”

The paper also explains the various pitfalls of the plantation drives.

It points out that planting in ecosystems with naturally sparse tree cover, such as savannas and peatlands is proving destructive for biodiversity and counterproductive for addressing climate change.

There are ecosystems that do not naturally support dense tree cover. Thus, establishing tree plantations, where forests did not historically occur, destroys the habitats of plants and animals adapted to such open ecosystems and, threatens the livelihoods of people dependent on those ecosystems. The iconic savannas of Africa are a prime example of the ecosystems that are threatened by large-scale afforestation campaigns.

"So it is the ecosystems, not tree planting campaigns which capture and store carbon. Afforestation provides less long-term carbon storage than maintaining savannas in their open state, where most carbon is protected from fire and herbivory underground the earth," the paper states.

Explaining more about the paper, Divya Gupta, senior research fellow at the Bharti Institute of Public Policy in Hyderabad and a co-author told NewsClick, "The paper offers critical lessons for actors involved in land use management in India, including the lesson that planting trees without addressing the social drivers that caused deforestation in the first place will not mitigate climate change because those same drivers will shift ecosystem destruction elsewhere."

Sanjay Gubbi, a conservationist and biologist, condemned such plantation drives in woodland savannah of Karnataka in India and said, "Endemic flora and fauna of the woodland savannah in Karnataka will, unfortunately, disappear if it continues to be transformed with afforestation activities. An endemic, threatened cycad plant species called Cycas swamyi which has been surviving only in woodland savannahs from the days of dinosaurs now face the peril of disappearance."

He pointed out that another natural habitat which is seriously threatened is the scrubland. Recently, a new species of fan-throated lizard Sitana dharwarensis was discovered in such a habitat in Northern Karnataka. Gubbi said that many such lesser known species would be gone from such eco-system, which is perceived as wasteland, before they are known to the outside world.

He also cautioned about the threat seed balls which consist of seeds of a tree species rolled within a ball of clay and compost and thrown in areas of interest as part of an afforestation drive. "The soil in these seed balls could already be containing seeds of invasive plant species like lantana, or parthenium, thus proving detrimental to the entire ecosystem if spread through the seed balls," he said, adding, "Planting of trees without basic understanding of ecology of natural habitats can prove to be a nightmare."

MK Ranjitsinh, legendary conservationist, pointed out as to how we lost the Great Indian Bustard from Ranibennur Wildlife Sanctuary in Gujarat and other grasslands by changing their land use for commercial agrarian and plantation purpose.

Claiming that such changes have already become visible, Neeraj Mahar, a research associate at Wildlife Institute of India, said that NASA's satellite images also show how India's browner parts – the arid and semi-arid landscape are being converted into greens. The draft of the recent amendment of National Forest Policy, too, pave the way for afforestation programs in these regions under Compensatory Afforestation Fund. This will result in severe ecological repercussions, he said.

A few months earlier, millions of locusts had travelled across the African and Asian deserts, thriving on desert farms. In India, it infested approximately 170,000 hectares of farms in the states of Rajasthan and Gujarat, not to talk about their invasion in other adjoining cities. The Food and Agriculture Organization of the United Nations (FAO) termed it a natural calamity.

Pointing at the locust infestation, Mahar added, "The locust outbreak is a man-made crisis and, using exponential amount of insecticide to control them is compounding it further. Meanwhile, states like Haryana, a semi-arid region, is now giving up the experimental crops like rice due to lack of water availability. Hence such imprudent changes in agricultural and greening practice are also bringing new challenges."

The authors of the paper also stress that since ecosystems are crucial to carbon sequestration, avoiding deforestation, improving forest management, and protecting grasslands, peatlands, and shrublands from land-use conversion should be the priority.

Forests can re-grow from seeds or sprouts even on deforested land without tree planting, it adds. Assisted Natural Regneration (ANR) may help, if natural is insufficient. Under ANR, the selected site is fenced for protection from any outside interference or disturbance. This allows nature to play its role in helping the plants to grow unfettered and for seedlings to grow on their own. “Natural regeneration often leads to faster forest recovery, greater carbon storage, and more co-benefits for biodiversity and people, misapplied tree planting can hinder forest regrowth,” the paper says.

Elaborating on ANR, Sanjeev Chaturvedi, chief conservator of forests in Uttarakhand and Maysaysay award winner, told NewsClick , “Our researchers carried out on ANR experiment in Kanchula-Khark, Kedarnath Forest Division of Uttarakhand and found that since March 2019, around 382 fir trees, 145 Kharsu plants and a number of shrubs, herbs and lower plants grew in just a span of seven months over half an acre land.”

Quite ironically, in the name of forest restoration initiatives, fast-growing plantations of commercial pulp and timber species are promoted as a natural climate solution despite clear evidence that these plantations lead to little long-term carbon storage. Worse yet, widely planted species in the genera Pinus (pine) and Eucalyptus are extremely flammable and can exacerbate wildfire risk and ecosystem carbon loss. Thus, the paper states, fast growing trees serve majorly economic purpose and, less likely the role of forest restoration or a natural climate solution.

There are other commonly held myths or misconceptions which the paper seeks to bust. One, that trees always enhance water availability. If grown in wrong places, planted forests deplete ground water and can cause streams to dry up by increased evapotranspiration.

Another is that some trees can warm the atmosphere. Trees, particularly evergreen conifers, are darker and taller than most other land covers, and therefore absorb more visible and ultraviolet sunlight (shortwave radiation) compared to highly reflective bare ground, snow, or grasses.

There is another perspective of tree plantation which showcases how countries from the Global North push the world’s poorest people and most threatened ecosystems in the Global South to bear the costs of using pricey land for massive tree plantation, although the majority of carbon emissions come from these industrialised countries of the Global North.

Globally, the most prominent land-based source of carbon emissions is the expansion of commodity agriculture. The authors of the paper recommend that in order to protect ecosystems from commodity agriculture, it is essential to secure the rights of rural and indigenous people to make land management decisions. Land rights must be coupled with economic policies that support ecosystem-friendly land-use practices, provide just compensation for the carbon that ecosystems store, and offer incentives for governments, corporations, and land managers to conserve ecosystems.

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