

**Plant a tree: Milan's ambitious plans to be cleaner, greener****News 24, 10 December 2018**

If Italy's fashion capital has a predominant colour, it is gray – not only because of the blocks of neoclassical stone buildings for which the city is celebrated, but also due to its often-gray sky, which traps pollution.

But Milan now wants to shift its color palette toward green.

The city has ambitious plans to plant 3 million new trees by 2030 – a move that experts say could offer relief from the city's muggy, sometimes tropical weather.

Some ad-hoc projects have already contributed to environmental improvements. Architect Stefano Boeri's striking Vertical Forest residential towers, completed in 2014 near the Garibaldi train station, aims to improve not only air quality but the quality of life for Milan residents.

Boeri created a small island of greenery in the heart of Milan, his pair of high-rises brimming from every balcony with shrubs and trees that absorb carbon dioxide and PM10 particles, a pollutant with links to respiratory ailments and cancer.

"I think the theme of forestation is one of the big challenges that we have today. It is one of the most effective ways we have to fight climate change, because it is like fighting the enemy on its own field," Boeri said. "It is effective and it is also democratic, because everyone can plant trees."

The UN climate summit taking place now in Poland has urged cities and regions to help achieve the goals of the 2015 Paris agreement on curbing global warming, which include limiting the increase in the planet's temperature to 2°C this century.

Also, the World Economic Forum's global agenda council has put extending the tree canopy among its top urban initiatives, recognising that small-scale changes can have a major impact on urban areas, including helping to lower city temperatures, creating more comfortable microclimates and mitigating air pollution.heart, even at relatively low levels of air pollution exposure.

6 planting urban forests to counter india's pollution**Ventures Africa, 06 December 2018**

"Palash, Arjun, Babul, Kalm..." Sunny Verma, executive director of the Indian company Afforestt, reeled off the names of the indigenous trees that have been planted to create an urban forest in the heart of Delhi. Aiming to cleanse the Indian capital of its air pollution, the for-profit social enterprise is one of many Indian ventures taking a stand against climate change through forestry.

The city suffers from bad air quality in both summer and winter and has a particularly poor track record in tackling it – a problem that is common to much of the country. Last June, the World Health Organisation's World Global Ambient Air Quality Database showed that 11 of the 12 cities with the worst air quality in the world were in India.

Along with high levels of particulate matter, India also struggles with high CO2 levels in the atmosphere, worsened by the country's serious depletion of green cover. Although official figures claim that India has increased its green cover since the turn of the century, alternative estimates beg to differ. Global Forest Watch (GFW) – a collaborative project involving the University of Maryland, Google, USGS and NASA – suggests a sharp decline in the country's green cover and ranks it 14th among those with the greatest tree cover losses from 2000 to 2010.

As part of the 2015 Paris Agreement, India pledged to "reduce the emissions intensity of its GDP by 33-35% from 2005 levels by 2030," but the country's government seems to be dragging its feet on implementation.

The Indian Ministry of Environment, Forest and Climate Change recently replied to a public query stating that his administration had not yet issued any orders to the states on how to accomplish the country's National Determined Contributions.

**Pollutant Removal from House****NATIONAL BOTANICAL RESEARCH INSTITUTE, LUCKNOW****This plant will give clean indoor air by removing pollutants inside house****India Today, 22 December 2018**

Clean air is becoming a luxury as humans tread towards future. People have already been spending their cash on air purifiers; anti-pollution masks in several India cities have been selling like hot cakes. But there is now a modified plant to provide clean indoor air.

Researchers have genetically modified a common indoor plant -- pothos ivy -- to remove pollutants inside the house including chloroform and benzene that have been linked to cancer, according to a new study.

The modified plants express a protein, called P450 2E1 or 2E1, which transforms these compounds into molecules that the plants can then use to support their own growth, according to an IANS report.

"People have not really been talking about these hazardous organic compounds in homes, and I think that is because we could not do anything about them," Stuart Strand, Professor at the University of Washington, said.

For the study, the team tested how well their modified plants could remove the pollutants from air compared to normal pothos ivy. IANS reported that the researchers put both types of plants in glass tubes and then added either benzene or chloroform gas into each tube. Over 11 days, they tracked how the concentration of each pollutant changed in each tube.

Findings, published in Environmental Science and Technology, showed that for the unmodified plants, the concentration of either gas did not change over time. However, for the modified plants, the concentration of chloroform dropped by 82 per cent after three days, and it was almost undetectable by day six. In addition, the concentration of benzene also decreased in the modified plant vials by about 75 per cent.

New houseplant can clean your home's air**Science Daily, 19 December 2018**

We like to keep the air in our homes as clean as possible, and sometimes we use HEPA air filters to keep offending allergens and dust particles at bay. But some hazardous compounds are too small to be trapped in these filters. Small molecules like chloroform, which is present in small amounts in chlorinated water, or benzene, which is a component of gasoline, build up in our homes when we shower or boil water, or when we store cars or lawn mowers in attached garages.

Both benzene and chloroform exposure have been linked to cancer. Now researchers at the University of Washington have genetically modified a common houseplant -- pothos ivy -- to remove chloroform and benzene from the air around it. The modified plants express a protein, called 2E1, that transforms these compounds into molecules that the plants can then use to support their own growth. The team will publish its findings Wednesday, Dec. 19 in Environmental Science & Technology.

"People haven't really been talking about these hazardous organic compounds in homes, and I think that's because we couldn't do anything about them," said senior author Stuart Strand, who is a research professor in the UW's civil and environmental engineering department. "Now we've engineered houseplants to remove these pollutants for us." The team decided to use a protein called cytochrome P450 2E1, or 2E1 for short, which is present in all mammals, including humans. In our bodies, 2E1 turns benzene into a chemical called phenol and chloroform into carbon dioxide and chloride ions. But 2E1 is located in our livers and is turned on when we drink alcohol. So it's not available to help us process pollutants in our air.

"We decided we should have this reaction occur outside of the body in a plant, an example of the 'green liver' concept," Strand said.



Snowpack declines may stunt tree growth and forests' ability to store carbon emissions

Science Daily, 01 December 2018

Researchers conducting a 5-year-long study examining snow cover in a northern hardwood forest region found that projected changes in climate could lead to a 95 percent reduction of deep-insulating snowpack in forest areas across the northeastern United States by the end of the 21st century.

The loss of snowpack would likely result in a steep reduction of forests' ability to store climate-changing carbon dioxide and filter pollutants from the air and water. The new findings, out today in *Global Change Biology*, highlight a growing understanding of the broad impact of climate change across seasons on forest ecosystems, according to scientists who leveraged six decades of data showing declining winter snowpack at Hubbard Brook's forest.

The 7,800-acre research forest in New Hampshire is heavily populated by sugar maple and yellow birch trees, and has been used for over 60 years to study changes in northern hardwood forests -- an ecosystem covering over 54 million acres and stretching from Minnesota to southeastern Canada.

"We know global warming is causing the winter snowpack to develop later and melt earlier," said the paper's first author Andrew Reinmann, an assistant professor and researcher with the Environmental Science Initiative at the Advanced Science Research Center (ASRC) at The Graduate Center, CUNY, and with Hunter College's Department of Geography. "Our study advances our understanding of the long-term effects of this trend on northern hardwood forests -- which are critical to North America's environmental health and several industries. The experiments we conducted suggest snowpack declines result in more severe soil freezing that damages and kills tree roots, increases losses of nutrients from the forest and significantly reduces growth of the iconic sugar maple trees."

Greener days ahead for carbon fuels?

Science Daily, 06 December 2018

When you take a piece of copper metal, it may feel smooth to the touch, but at the microscopic level, the surface is actually bumpy -- and these bumps are what scientists call "active sites," said Joel Ager, a researcher at JCAP who led the study. Ager is a staff scientist in Berkeley Lab's Materials Sciences Division and an adjunct professor in the Department of Materials Science and Engineering at UC Berkeley. These active sites are where the magic of electrocatalysis takes place: electrons from the copper surface interact with carbon dioxide and water in a sequence of steps that transforms them into products like ethanol fuel; ethylene, the precursor to plastic bags; and propanol, an alcohol commonly used in the pharmaceutical industry.

Ever since the 1980s, when copper's talent for converting carbon into various useful products was discovered, it was always assumed that its active sites weren't product-specific -- in other words, you could use copper as a catalyst for making ethanol, ethylene, propanol, or some other carbon-based chemical, but you would have to go through a lot of steps to separate unwanted, residual chemicals formed during the intermediate stages of a chemical reaction before arriving at your final destination -- the chemical end-product.

"The goal of 'green' or sustainable chemistry is getting the product that you want during chemical synthesis," said Ager. "You don't want to separate things you don't want from the desirable products, because that's expensive and environmentally undesirable. And that expense and waste reduces the economic viability of carbon-based solar fuels." "When we thought of the experiment, we thought that this is such an inobvious idea, that it would be crazy to try it," Ager said. "But we couldn't let it go, because we also thought it would work, as our previous research with isotopes had enabled us to discover new reaction pathways."



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Niti Aayog: To Stop Pollution

NATIONAL BOTANICAL RESEARCH INSTITUTE, LUCKNOW

Take action to stop waste water pollution of rivers: NITI Aayog

The Week, 20 December 2018

Waste water discharge from industrial units into rivers and other water bodies should be reduced to zero and stringent civil penalties to strengthen enforcement of environment-related acts were among recommendations of the NITI Aayog's comprehensive national strategy for 2022-23. The NITI Aayog on Wednesday unveiled its comprehensive national Strategy for New India, which defines clear objectives for 2022-23. It is a detailed exposition across forty-one crucial areas, including gender issues and sustainable environment, and suggests the way forward for achieving the stated objectives. On sustainable environment, the report said a major contributor to air pollution is the practice of burning crop residue, particularly in north India, and convincing farmers to discontinue the practice by providing alternative methods of disposal through economically productive use of crop residues is a key challenge. Another key challenge identified by it is lack of awareness of the ill effects of pollution.

"This makes it difficult to bring about the behavioural change that is critical to fighting pollution. 'Polluters should pay for the pollution' principle is not effectively implemented," the report said. The report also came out with a set of recommendations to combat pollution which included measures like constituting a task force to study and implement measures to control pollution from brick kilns. "The focus of this task force should be on the technological upgradation of kilns to control pollution. Emission and effluent standards for industries need to be revised and effectively implemented," it said. Sewage treatment plants of adequate capacity should be installed at suitable locations to make rivers pollution free, it recommended. Waste water discharge from industrial units into rivers and other water bodies should be reduced to zero and stringent civil penalties to strengthen enforcement of environment-related Acts were among recommendations of the report.

Niti Aayog sets stiff targets to curb air pollution, pitches for stringent civil penalties

The Times of India, 20 December 2018

NEW DELHI: The central government's think-tank, Niti Aayog, in its strategy paper 'New India at 75', has set ambitious targets to curb air pollution and recommended introduction of "stringent civil penalties to strengthen enforcement" of all environment-related acts to keep water, soil and forests safe.

Underlining the problem of air pollution and its ill effects on human health, it pitched for bringing the hazardous PM2.5 levels within the National Ambient Air Quality Standards in all cities across the country by 2022-23 and set a target of completely eliminating the practice of crop residue burning in the problem areas by that time.

In the paper released on Wednesday, the Aayog has put these two targets along with two others - creating 175 GW of renewable energy generation capacity and ensuring coverage of all households with LPG for cooking - as its goals to deal with the menace of air pollution by the time the country celebrates 75 years of independence in 2022.

Though the government has already been working on these fronts, bringing down PM2.5 levels in Indian cities to less than 50 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) - as specified in the strategy document - means over 100 cities will have to undertake stringent measures. All these are non-attainment cities whose air quality is worse than the National Ambient Air Quality Standards. These cities include Delhi, Mumbai, Pune, Varanasi, Kanpur, Lucknow, Allahabad, Patna, Gaya, Kolkata, Bengaluru, Chandigarh, Jaipur, Patiala, Jalandhar, Ludhiana and Hyderabad among others.

Among all toxins, PM2.5 (particulate matter with a diameter of less than 2.5 micrometers) poses the greatest health risk as it can penetrate deep into a person's lungs or cardiovascular system. Some of the non-attainment cities such as Delhi, Patna, Gaya and Kanpur have an average PM2.5 level that is much higher (twice or thrice) than the prescribed standards.