



### China to plant forest the size of Ireland in bid to become world leader in conservation

**The Telegraph News, 05 January 2018**

The move is China's latest bid to shed its polluting image and become world leader in environment protection, since President Donald Trump chose to withdraw the US from the Paris Climate Agreement last year. China's State Forestry Administration target is to increase the number of hectares of forest in the country to 23 per cent of the total land by 2020, with the figure currently at 21.7 per cent. Zhang Jianlong, head of the administration, said that by 2035 the figure will be up to 26 per cent.

"Companies, organisations and talent that specialise in greening work are all welcome to join in the country's massive greening campaign," he said. "Cooperation between government and social capital will be put on the priority list."

In 2014 China, which has seen its cities blighted with chronic air pollution due to rampant industrial expansion in the past few decades, declared a "war on pollution". As well as cracking down on polluting companies and punishing officials who break environmental rules, forest expansion and cleaning up polluted rivers have become top priorities. This year the new forest areas will be built in the northeast Hebei province, Qinghai province in the Tibetan Plateau, and in the Hunshandake Desert in Inner Mongolia, an autonomous region in the north.

Mr Zhang said that the country had spent over 538 billion yuan (£61bn) on planting forests in the past five years, raising the total amount of it in China to 208 million hectares.

The government has also introduced "ecological red line" policies that require local governments to curb what they deem to be "irrational development" and construction near forests, rivers and national parks.

### 20 percent more trees in our megacities would mean cleaner air and water, lower carbon, less energy use

**Elsevier, 18 January 2018**

Planting 20 percent more trees in our megacities would double the benefits of urban forests, like pollution reduction, carbon sequestration and energy reduction, according to a study in *Ecological Modelling*. The authors of the study, which was carried out at Parthenope University of Naples in Italy, say city planners, residents and other stakeholders should start looking within cities for natural resources and conserve the nature in our urban areas by planting more trees. Their work has been selected by an international scientific committee to be given the Atlas award. Nearly 10 percent of the world's population live in megacities – cities of at least 10 million people. While those people often rely on nature outside of the city for their food and recreation, nature within the city in the form of urban forests can provide enormous benefits. An urban forest contains the single tree in someone's back yard, the row of trees along a street or a wooded area in a public park; joining these areas with additional trees extends the size of the urban forest. Many famous examples of urban forests in the megacities were studied, from Central Park in New York City to St. James' Park in London and Bosque de Chapultepec in Mexico City. On average, about 20 percent of the area of each of the world's megacities is urban forest today. But the new study reveals that a further 20 percent could be transformed into forest – something that would change residents' lives for the better. "By cultivating the trees within the city, residents and visitors get direct benefits," explained Theodore Endreny, Ph. D., PH, PE, lead author of the paper and now professor of the Department of Environmental Resources Engineering at the State University of New York ESF campus.



### **Carbon fibre made from plants can save fuel, reduce pollution, and is much cheaper!**

**India Today, 15 January 2018**

Carbon fibre, the superman of materials, is five times stronger than steel, while being only a fraction of the weight of steel. It is used in everything from tennis rackets to golf clubs to bicycles to wind turbine blades to passenger airplanes to Formula One race cars.

#### **WHY IS CARBON FIBRE SO COSTLY?**

Carbon fibre is made from a chemical called acrylonitrile.

Currently, producers make acrylonitrile from oil, ammonia, oxygen and an expensive catalyst.

This process produces a lot of heat and yields a toxic by-product, hydrogen cyanide. And, because acrylonitrile is made from petroleum, the cost of carbon fibre tends to rise and fall with the price of oil.

Now, you could own a car made from carbon fibre, kind of resembling those F1 beauties: which would be ultra-light, require lesser fuel, and will automatically save you up on a lot of guilt-inducing pollution-- and how!

Scientists from the US Department of Energy's National Renewable Energy Laboratory (NREL), Colorado, have developed a new process for producing acrylonitrile (the chemical that carbon fibre is made of) that makes use of plants -- namely the parts that we can't eat-- such as corn stalks and wheat straw.

#### **THE STUDY: RENEWABLE ACRYLONITRILE PRODUCTION**

This study on producing bio-based renewable acrylonitrile, was called Renewable Acrylonitrile Production and was published in the journal Science.

The team of researchers, led by Gregg Beckham, broke these materials down into sugars, which were then converted into an acid and combined with an inexpensive catalyst to produce the chemical, acrylonitrile.

### **Scientists are making carbon fiber from plants instead of petroleum**

**Popular Science, 12 January 2018**

Carbon fiber is the Superman of materials. Five times stronger than steel and a fraction of the weight, it is used in everything from tennis rackets to golf clubs to bicycles to wind turbine blades to passenger airplanes to Formula One race cars. There's just one catch: Carbon fiber is made from oil and other costly ingredients, making the end product exceptionally expensive. That's why carbon fiber shows up in race cars but rarely makes it into minivans.

That could change. Scientists say it may soon be possible to make carbon fiber from plants instead of petroleum, driving down costs, making the material more widely available for use in cars, planes and other vehicles.

Carbon fiber is made from a chemical called acrylonitrile. Currently, producers make acrylonitrile from oil, ammonia, oxygen and an expensive catalyst. The process produces a lot of heat and yields a toxic byproduct. And, because acrylonitrile is made from petroleum, the cost of carbon fiber tends to rise and fall with the price of oil.

"Acrylonitrile prices have witnessed large fluctuations in the past, which has in turn led to lower adoption rates for carbon fibers for making cars and planes lighter weight," said Gregg Beckham, a group leader at the National Renewable Energy Laboratory and coauthor of a recent paper detailing this research. "If you can stabilize the acrylonitrile price by providing a new feedstock from which to make acrylonitrile," he said, adding, "we might be able to make carbon fiber cheaper."

Beckham and a team of researchers at the National Renewable Energy Laboratory developed a new process for producing acrylonitrile that makes use of plants.

**How polluted is Chennai's air? We may not know****The Times of India, 29 January 2018**

London has a live tracker measuring each breach of hourly levels of toxic nitrogen dioxide and is accordingly shifting clean buses onto the most polluted routes, and Delhi has tried out everything from bans to fines, but Chennai lags behind at least by a decade — in terms of mechanism to track pollution and government policies to control it.

The TN Pollution Control Board (TNPCB) has three continuous monitoring stations in Koyambedu, Kodungaiyur and Royapuram that are operated twice a week, that too, on a rotational basis. The data generated is then sent for validation to a US-based firm with laboratories in Hyderabad. A week later, the validated data is released on the TNPCB website. Since there are variations while collecting data, validation is mandatory to ensure precision, say TNPCB officials. The validation may sometimes take a week to a fortnight and the website update is not always regular.

"There are also manual stations in Adyar, Ambattur, T Nagar, Nungambakkam, Kilpauk, Tiruvottiyur, Manali and Kathivakkam," said a pollution control board engineer. According to PCB officials, while the continuous monitoring stations can be calibrated to monitor fine particulate matter with a radius of 2.5 micrometres (PM<sub>2.5</sub>), levels that are generated mostly due to vehicular and industrial pollution, the manual stations only monitor PM<sub>10</sub> levels.

In 1989, the industrial belt of Manali, Kathivakkam and Tiruvottiyur got the first air quality monitoring station in the city. The second set of stations became operational eight years later in five more spots. These stations initially monitored ambient air quality for eight hours starting from 8am. Only in 2002, they were made continuous monitoring stations, approved by the United States Environmental Protection Agency. When asked whether the board has any plans to increase the number of monitoring stations in the city, a senior official said they have no such plans.

**Air pollution affects at least 47 million Indian children****The First Mail, 29 January 2018**

At least 47 million children under the age of five live in areas facing severe air pollution with dangerous effluent density, a report said on Monday.

The report by Greenpeace-India, based on data from state and central pollution control boards, asserted that as many as 47 million children live in areas with pollutant PM<sub>10</sub>, or particulate matter in the air with diameter less than 10 microns, exceeding the safe limits.

Of these 47 million children, all under five years of age, 17 million live in areas with PM<sub>10</sub> twice the permissible standards or safe limit.

National capital Delhi, along with Uttar Pradesh, Rajasthan, Bihar and Maharashtra, are the places where children are "worst affected".

"Together these states are home to 12.9 million children, who are below or up to five years of age, trapped in bad air exceeding by more than twice the annual standard," the report said.

The report analyses PM<sub>10</sub> annual average recorded for 280 cities, which account for 630 million, or 53 per cent citizens of the country's total population.

Interestingly, the condition or air quality under which rest 47 per cent of population resides is unknown.

"A massive part of the population, 580 million or 47 per cent are living in areas where no air quality data is available," the report pointed out.

Delhi remained the worst-affected city with annual PM<sub>10</sub> levels exceeding approximately five times the national ambient air quality standards.

The safe limit for PM<sub>10</sub> as per national standards is 60 microgrammes per cubic meters (annual average).

**Effect of soil pollution: Flora****NATIONAL BOTANICAL RESEARCH INSTITUTE, LUCKNOW****The Effects of Soil Pollution on Plants & Flora****Sciencing, 09 January 2018**

Soil pollution has many causes. Contaminants can be directly introduced. Soil can be contaminated by air pollution when precipitation deposits acidic compounds such as sulfur dioxide and nitrogen oxide.

Human activities such as mining can release acidic drainage, which can have widespread effects. Whatever the cause, soil pollution has negative effects on plants and flora as well as the organisms that depend upon them.

**Micro-organisms**

Acidic soils created by deposit of acidic compounds such as sulfur dioxide produce acidic environment that is not tolerated by micro-organisms, which improve the soil structure by breaking down organic material and aiding in water flow.

**Photosynthesis**

Soils polluted by acid rain have an impact on plants by disrupting the soil chemistry and reducing plants' ability to take up nutrients and undergo photosynthesis.

**Aluminum**

While aluminum occurs naturally in the environment, soil pollution can mobilize inorganic forms, which are highly toxic to plants and can potentially leach into ground water, compounding their effects.

**Algal Blooms**

Contaminated soils with high levels of nitrogen and phosphorus can leach into waterways, causing algal blooms, resulting in the death of aquatic plants due to depleted dissolved oxygen.

**pH**

Acidic deposition into the soil can hamper its ability to buffer changes in the soil pH, causing plants to die off due to inhospitable conditions.

**Tomato plants grown in heavy metal contaminated soil found to produce contaminated fruit****Pollution News, 14 January 2018**

As many people strive to start out the new year with healthy eating habits, it's important to keep in mind that choosing the right vegetables is just as important to your health as consuming them in the first place. That's because vegetables are prone to contamination not only from pesticides but also from the air, water and soil in which they are grown.

In a recent study, researchers set out to find how heavy metal contamination in soil affects the physical and biochemical properties of tomatoes. The scientists measured several characteristics of tomatoes harvested from contaminated soil, including their fresh and dry weights, titratable activity, volume, diameter, length, carbohydrate content and lycopene levels.

They also examined secondary metabolites like flavonoids and total phenols, along with macronutrients and micronutrients. In addition, the researchers measured residual heavy metals like lead, cadmium, nickel and cobalt.

The researchers then compared these results to those of tomatoes that were cultivated in soil that was not contaminated. Not surprisingly, heavy metal soil contamination had an adverse impact on the tomatoes' lycopene levels, ascorbic acid, carbohydrate content, microelements, total soluble solids and titratable activity, in addition to the expected and very dangerous higher levels of heavy metals.

According to the European Food Safety Authority, the accumulation of heavy metals in the body can be very harmful.