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Tiger conservation in India saved one million tonnes of CO2: Study

NUS researchers find that project prevented deforestation, mitigating carbon emissions

Cheryl Tan

Tiger conservation in India – aimed at rescuing the country's iconic big cat from extinction – has a dual benefit of mitigating carbon emissions by preventing deforestation, a recent study has found.

At least one million tonnes of carbon dioxide (CO2) have been saved thus far – a climate co-benefit reaped from decades of tiger conservation, according to the study conducted by researchers from the National University of Singapore's Centre for Nature-Based Climate Solutions (NUS CNCS) which took just over a year.

There are 53 tiger reserves in India, which add up to an area of 75,796 sq km – about 2 per cent of the country's land area.

As at 2022, there were 3,167 tigers in India, a 6.7 per cent increase from 2,967 in 2018, according to a report by India's National Tiger Conservation Authority in April 2023.

Compared with other protected areas in the country, tiger reserves are more stringently monitored and get increased funding to ensure that the animals' forested habitats are kept intact, to ensure sufficient prey and to provide safe breeding grounds for them to thrive.

To determine and quantify the climate impact of these reserves, researchers from NUS CNCS studied 45 reserves which have been around long enough for the impact of the tiger-conservation policy to be felt.

For instance, the researchers selected reserves which were established from 2007, as the National Tiger Conservation Authority was formed only in 2005. The authority's focus is to improve tiger conservation through a more ambitious policy.

This helped to improve management of protected areas for tigers through more enhanced technological tools for monitoring, such as Global Positioning System-based mobile tools, for example, said Mr Aakash Lamba, who was the first author of the study.

The study, which was published in scientific journal Nature Ecology and Evolution on May 25, also found that deforestation rates went down at 11 of the tiger reserves analysed, amounting to over 5,800ha of forest saved.

But four of the reserves, which were part of the study, still had higher-than-expected rates of forest loss, which were likely a result of shifting agricultural practices, illegal timber trade and mining that have been reported in the peripheries of notable tiger reserves such as Kaziranga National Park and Dampa Reserves in north-east India.

The net-avoided emissions of around 1.08 million tonnes of CO2 helped India, which has 53 tiger reserves, save about US$93 million (S$126 million) – what it would have had to face in environmental damage if the CO2 had been released. ST FILE PHOTO

"The remoteness and lower development of reserves in north-east India had probably led to less effective enforcement and a higher risk of deforestation," said the study.

As for the remaining 30 reserves which were part of the study, the researchers did not have enough statistical evidence to suggest a link between tiger conservation and climate-change benefits, said Mr Lamba.

Overall, the study concluded that the net-avoided emissions from the tiger reserves remained at around 1.08 million tonnes of CO2 – which is equivalent to taking about 200 cars off the road for a year. These avoided emissions helped the country save about US$93 million (S$126 million) – which is what India would have had to face in environmental damage if the CO2 were released into the atmosphere.

As India, like all other countries, is vulnerable to extreme weather events brought on by climate change, avoiding CO2 emissions through better forest protection could help mitigate climate impacts like damage to agriculture, and help the country to secure a more sustainable future, said Mr Lamba.

By being able to quantify the additional climate benefits from protecting the tigers, the researchers hope that this could unlock novel sources of nature-conservation funding.

For instance, revenue could be raised for conservation through the sale of carbon credits for each tonne of CO2 saved.

The revenue thus raised can be channelled back into biodiversity conservation, which may be used for enhancing the livelihoods of local communities, improving existing reserves, establishing new ones, and starting new initiatives such as sustainable and equitable eco-tourism programmes, said Mr Lamba.

The team is looking to expand its study in various areas, such as understanding the perceptions of local communities on the tiger-conservation policy, so that they could be better included in the authorities' decision-making process.

Media reports have said that indigenous communities have become increasingly displaced over the past few decades as a result of continued tiger-protection efforts.

Another area of research would be to look into the impact of forest degradation on the carbon stock and overall quality of the forests.

Forest degradation occurs due to excessive logging, or as a result of demand for wood or charcoal as biomass, causing parts of trees to be cut down.

"We also want to look at the impact of this tiger-conservation policy on other species, such as native birds, reptiles and amphibians which are also threatened and share the habitat space," said Mr Lamba.

tansuwen@sph.com.sg