New mapping tool helps to spot potential sources of carbon credits

It will identify where natural ecosystems like tropical forests, mangroves can be conserved

Cheryl Tan

A new mapping tool to identify where natural ecosystems like tropical forests and mangroves can be conserved has been launched to identify potential sources of carbon credits.

Carbon credits refer to permits which companies or countries can buy from, say, a forest conservation project in Indonesia, to offset their greenhouse gas emissions.

Each credit represents one tonne of emissions.

The platform, known as Carbon Prospecting, was launched by the National University of Singapore's Centre for Nature-based Climate Solutions (CNCS) and ST Engineering's satellite data and geospatial analytics business, Geo-Insights.

Professor Koh Lian Pin, the director of NUS CNCS, said the platform focuses on forests which are threatened by deforestation and identifies areas that are carbon-rich to help policymakers and investors develop projects to tap a potential source of high-quality carbon credits.

As trees trap carbon dioxide (CO_2) from the atmosphere for storage, existing forests can be a source of carbon credits, which can be calculated by measuring the amount of CO_2 the trees have trapped.

The platform allows users to compare how much high-quality carbon credits can be generated from different parts of the world.

For example, it shows that Indonesia and Malaysia are among the best countries to avert carbon emissions by protecting their forests.

The platform also enables users to calculate the estimated yield of carbon credits and their financial return on investment, based on the conditions they seek, such as the duration of the project, costs of running the project and their expected carbon price.

In addition, the platform quantifies the possible benefits of conserving tropical forests, such as their impact on biodiversity, clean water supply for those living around the area and their food security.

Having such information on the co-benefits allows buyers to better assess the quality of the carbon credits, said Prof Koh.

"The demand for high-quality, nature-based carbon credits often outstrips supply. So such a platform can help developers to shorten the often complicated and costly process of identifying carbon project sites which would deliver the greatest benefits," he added.

The platform was launched on Sept 22 at the World Economic Forum – Champions for Nature event in New York during Climate Week NYC 2022.

It is based on recently published peer-reviewed studies and ongoing research led by CNCS researchers, and will help to fill major research and development gaps that have hampered the implementation of nature-based climate solutions globally.

These gaps include uncertainties over the location of the most promising carbon stocks and where natural ecosystems are benefiting society the most, noted Prof Koh.

The NUS CNCS team will look for partners to develop more sophisticated versions of the current platform, said Prof Koh.

He envisions a global carbon intelligence platform that incorporates more layers of information – such as the importance of mangrove forests in providing coastal and flood protection – as well as the constraints and risks that nature-based projects may be facing.

Professor Stuart Pimm, the Doris Duke Professor of Conservation at Duke University, who was not involved in the study, said: "To protect biodiversity – and stop the deforestation that contributes to so much carbon emissions and global heating – we need to know where the forests and their carbon are.

"This vitally important tool provides that information."

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Taking credit for nature conservation

There is a lack of supply of carbon credits even though they are in high demand. Forest conservation projects are popular sources of carbon credits. A tool containing maps that identify where nature can be conserved has been launched. **Cheryl Tan** looks at how the tool works and the key issues of nature-based carbon credits in nature conservation.

HOW THE MAPPING TOOL WORKS

A new tool, Carbon Prospecting, maps out forests (green areas) and mangroves (blue areas) which are **carbon-rich and under threat of deforestation.**

Governments and project developers can use the map to **identify these potential sites for carbon credit projects.**

SOUTH AND CENTRAL AMERICA
AFRICA
ASIA
South Atlantic Ocean
Indian Ocean

Map shows potential forests and mangroves which are concentrated in three regions: Central and South America, Africa and Asia.

Users can use a tool to draw **an area of interest** to calculate the project's potential profits and its co-benefits

AT RISK OF DEFORESTATION

Forests
Carbon-rich — Less carbon-rich

Mangroves
Carbon-rich — Less carbon-rich

WHAT ARE CARBON CREDITS?

Each credit represents **one tonne** of emissions

Companies can purchase these credits to **offset their emissions**

These credits represent **emission reductions from projects** that help to reduce, remove and avert greenhouse gas emissions, like carbon dioxide

To be considered high-quality carbon credits, these credits must truly result in a reduction in greenhouse gas emissions, and the same credits **cannot be used to offset emissions from more than one company**

TYPES OF CARBON CREDIT PROJECTS

Nature conservation

As trees help to trap CO_2 from the atmosphere for storage, credits can be created from the CO_2 that is prevented from being released by conserving existing forests
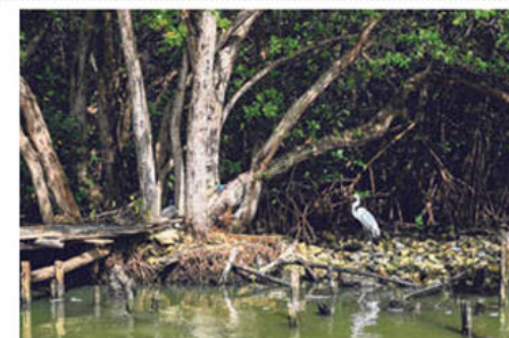

A burning area in the forest in Canutama, in the southern Amazonas state of Brazil in September 2022. Deforestation leads to the release of CO_2 into the atmosphere.

Reforestation

Credits are created based on the carbon captured by new trees that are planted

Mangrove forests – such as the Laguna San Jose in San Juan, Puerto Rico – protect coastal communities from sea-level rise and flooding.

Carbon capture using technology

- CO_2 is removed from the atmosphere and injected deep underground for storage
- Credits can be issued based on each tonne of CO_2 removed

Climeworks' carbon capture plant in Iceland.

FACTORS THAT DETERMINE THE CREDIBILITY OF NATURE-BASED CARBON CREDITS

Long-term benefits (permanence)
- A project needs to have a long-term climate benefit and mitigate the risk of natural disasters such as forest fires
- Developers could be made to set aside some credits as a buffer instead of selling all of them.
- These serve as insurance to compensate for CO_2 that is released into the atmosphere due to a forest being burned down, for instance.

Additional impact (additionality)
- CO_2 reductions from the project have to be additional to what would have happened if the project was not carried out.
- For instance, the carbon credits cannot be counted if the project involves a forest that was already going to be conserved.

Wider benefits (co-benefits)
- The conservation of natural habitats needs to benefit more than just the climate.
- Surrounding communities and wildlife should also benefit. For example, conserving mangroves could protect local communities from sea-level rise and flooding.

Greenwashing
- Critics of carbon credits have raised concerns that such projects are being used to substitute concrete action against climate change, such as replacing fossil fuels with renewable energy.
- To tackle this, countries like Singapore have placed a cap of 5 per cent on carbon emissions that can be offset with carbon credits instead of paying the carbon tax. The cap takes effect from 2024.