Amazon

Amazon basin DNA project aims to bolster indigenous people

of the region's biological assets are at risk of being lost forever

The giant monkey frog secretes a liquid that could be used in the next generation of antibiotics © Alamy

Joe Leahy in São Paulo 7 HOURS AGO

A project to map the DNA sequences of species in the Amazon river basin, which its backers say will encourage conservation by providing a new source of income for indigenous communities, is to enter the pilot phase in November.

The Earth Bank of Codes, which is being co-ordinated by the World Economic Forum and Peruvian entrepreneur Juan Carlos Castilla-Rubio, aims to map the "biological assets" in a part of the Amazon and codify their rights of usage for industry and researchers in a block chain bank by 2020.

The programme would then partner with leading scientists, corporates and start-ups to convert the genomic codes to products with the economic benefits to be shared with traditional communities and conservation funds.

"This could be a game-changer for the Amazon economy to the extent that one moves away from a commodity-based economy into something completely different," said Dominic Waughray, the WEF's head of public-private partnership.

The Amazon rainforest remains one of the world's biggest carbon banks, containing at least 15 per cent of the planet's biodiversity, yet faces intense pressure from illegal deforestation by ranchers and climate change.

Researchers warn many of the region's biological assets — molecular structures, chemicals and biological processes that could be of tremendous value to science and industry — are at risk of being lost forever.

A paper last year from scientists at the Universidad Nacional Autónoma de México and Stanford University warned that the earth was suffering a "sixth mass extinction", with the populations of 32 per cent of animals in the study falling.

The Earth Bank of Codes is related to a wider project, the Earth BioGenome Project, which aims to sequence all of the 1.5m species of plants, animals and single-celled organisms on earth (known as the eukaryotic species) within 10 years.

The Earth BioGenome Project, touted as the most ambitious initiative of its type since the Human Genome Project, is backed by the Smithsonian Institution in the US, the Beijing Genomics Institute, the Royal Botanical Gardens in the UK, the São Paulo Research Foundation and the US Department of Agriculture.

The challenge was to make this knowledge available to international science and industry while ensuring the results conformed with the Nagoya Protocol, an international treaty requiring profits from such projects to be equitably shared with the countries and communities that own the underlying biological assets, said Mr Castilla-Rubio.

To solve this problem, Mr Castilla-Rubio and the WEF proposed the Earth Bank of Codes, an open global digital platform that will register biological and biomimetic assets — intellectual property drawn from nature's functions and processes — on blockchain.

The blockchain will record the rights and obligations associated with the intellectual property and enable the tracking of its use and fair distribution of the benefits.

The first stage in the establishment of Earth Bank of Codes would be an Amazon Bank of Codes, starting with the pilot programme, said Mr Castilla-Rubio, who is chairman of a technology company, Space Time Ventures, and member of the World Economic Forum's Global Future Council on the Bioeconomy.

Past discoveries based on Amazonian products have proven extremely valuable, such as rubber trees in the last century and ACE inhibitors, used in the treatment of hypertension, in snake venom.

The Amazon rainforest contains at least 15 per cent of the planet's biodiversity © Reuters

Mr Castilla-Rubio cites possible modern equivalents, such as the giant monkey frog, which secretes a liquid with compounds that could be used in the next generation of antibiotics, or the traffic patterns of soldier ants, which are being studied by makers of autonomous vehicles.

"If the dividends are shared equitably, an inclusive bio-economy could be created in the Amazon," said Mr Castilla-Rubio.

But the challenge will be funding the programmes, analysts say. While the benefits, could be immense — the Human Genome Project, which cost $4.8bn, has generated $65 for the US economy for every public dollar invested, the Earth BioGenome Project is expected to cost $4.7bn to complete, according to WEF.

Mr Castilla-Rubio says initial support will come from "governments, philanthropists and the WEF".

Sylvia Coutinho, the chief executive of UBS in Brazil and a supporter of the project, said the first task would be to find seed capital, possibly through crowd funding. After that, the assets would

need to be valued.

“For it to become an investible asset class, it has to be homogeneous and have size, liquidity and standardisation,” she said.

Some help is coming from the Brazilian government, which is investing R$55m ($14.2m) over five years into a newly revamped Amazonian Biotechnology Centre in Manaus, capital of Amazonas state.

The centre would aim to streamline the cumbersome regulatory process for international companies developing products from the Amazon.

“Nowadays it’s a very complicated process, taking one year or two years,” said Yana Alves, executive secretary at Brazil’s Ministry of Industry, Foreign Trade and Services. The centre would aim to reduce that to “a couple of months”.