Add coastal vegetation to the climate critical list

Forests are protected, but carbon sinks in mangroves, seagrasses and marshes are ignored. **Margareth da Silva Copertino** *wants Brazil to change that.*

My country, Brazil, is home to 80% of the remaining Amazon rainforest, and has rightly worked to find ways to sustainably manage and commercialize these stocks of forest carbon. However, like most countries with long coastlines, Brazil has so far missed the opportunity to value and protect another important carbon store: its mangroves, seagrasses and tidal marshes.

The 9,000-kilometre vibrant and productive Brazilian coastline is covered with vegetated ecosystems that together contain hundreds of millions of tonnes of such carbon, at least. Brazil is home to the third-largest mangrove area in the world and has more than 20,000 hectares of seagrasses near tropical reefs and in coastal lagoons.

Why aren't these systems recognized as vital pieces of the climate-change puzzle? They cover just 0.5% of marine areas, but are among the largest carbon sinks in the ocean. Typically, they store up to 15 times more carbon per hectare than terrestrial soils, absorbed over hundreds or even thousands of years. And these coastal systems sequester carbon 10–50 times faster than terrestrial forests.

As the United Nations REDD+ scheme to protect the 'green' carbon stocks in tropical forests develops, it is time to broaden the reach of such mechanisms so that they also value and protect coastal stocks of 'blue' carbon.

In February, I took part in a scientific workshop in Paris to evaluate such mechanisms and offer policy-makers the information and advice they need to make them happen. The event was a meeting of the International Working Group on Coastal Blue Carbon, formed jointly by Conservation International, The International Union for Conservation of Nature and the Intergovernmental Oceanographic Commission of the UN Educational, Scientific and Cultural Organization. It concluded that coastal carbon deposits should be taken into account in national emission inventories and in the processes and mechanisms of the UN climate framework. The group will continue to meet over the next two years and will urge policy-makers to recognize the importance of blue carbon.

They must do this soon, because coastal areas are among the most threatened ecosystems on Earth. Between 30% and 50% of mangroves have disappeared in the past 50 years; about 30% of the world's seagrasses are gone; and half of the global coverage of salt marshes has been destroyed. That loss is continuing and in many places accelerating — 2% of those important coastal systems are lost each year. That is four times the estimated rate of tropical-forest loss.

Degradation and destruction of blue-carbon systems results in immediate and continued emissions. Studies by Duke University in Durham, North Carolina, estimate that emissions from such clearing result in up to 900 million tonnes of carbon dioxide emissions per year, roughly equal to the annual CO_2 emissions from energy consumption and industry for the whole of Germany. That is about 10–20% of the emissions from deforestation globally, or 2% of all anthropogenic greenhouse-gas emissions.

Brazil would be a good place to test new mechanisms to value and conserve blue carbon. The country has about 200 protected areas along the coastline, spanning different latitudes and ecosystems. But these cover just 20% of the country's total coastal territory, and represent only one-quarter of the area highlighted by the Brazilian government as a conservation priority. The country's mangroves, salt marshes and seagrasses are under mounting pressure from a combination of intense human activities, increasing coastal development (about one-fifth of the Brazilian population lives by the coast), agricultural run-off, pollution and intensive aquaculture. These rising threats require the urgent application of mechanisms to increase the monetary value of coastal habitats, promote their conservation and avoid further degradation.

DEGRADATION AND DESTRUCTION OF BLUE-CARBON SYSTEMS RESULTS IN IMMEDIATE EMISSIONS.

There is more to protecting coastal ecosystems than global recognition of their importance, however. We need focused and coordinated research, as well as scientific data collection, to build financial mechanisms that value these ecosystems as tools to reduce greenhouse-gas emissions.

But local policies and regulation are vital too. Developing nations must support small landowners and the livelihoods of local communities, expand the law-abiding 'responsible' fraction of economic sectors, improve law enforcement, effectively manage protected areas and recover the many degraded ones. In Brazil, as in other countries, we need to stop the destruction of existing mangroves, tidal marshes and seagrasses.

Effectively accounting for the carbon in coastal systems has the potential to transform the management and conservation of coastal areas on both the global and local scales. For the sake of Brazil and the world, my country should push for the role of oceans and their coastal ecosystems to be included in UN climate talks this year, alongside rainforests. Brazil has already played an important part in many of these discussions, but it could be a true leader if it were to recognize the significant potential hidden in its long, blue coast. ■

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