



NATURE BASED SOLUTIONS: CAN THEY HELP US STAY ALIVE AT 1.5°C?

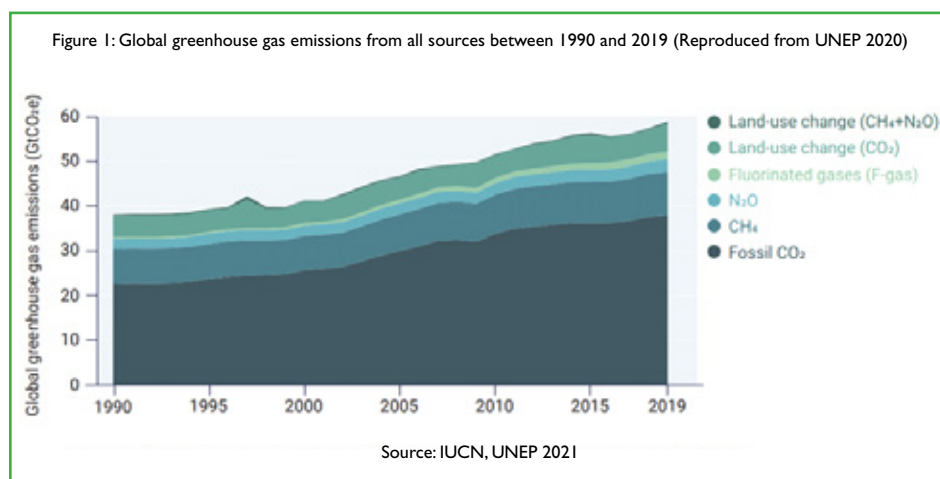
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The global community claims to be committed to finding a solution to arresting rising global temperatures limiting global warming to well below 2°C, preferably 1.5°C (UNFCCC, 2022)¹, to ensure that all life, livelihoods and the overall health and welfare of ecosystems animals and humans are secured (IPCC 2018). The International Panel on Climate Change (IPCC) reports paint a picture that shows increased intensity and frequency of climatic conditions and extreme events as emerging trends (IPCC 2018). Global warming beyond 1.5°C will be devastating; in fact, projections show at 2°C warming many ecosystems will fail and, without the provision of these life sustaining ecosystem services, life will not be possible (IPCC 2018).

It is estimated that two-thirds of the Earth’s surface is covered with water. Of this amount, around 97.5 percent is held in the oceans as salt water.

The concept of nature-based solutions was first introduced by The International Union for Conservation of Nature (IUCN) at their 2016 World Conservation Congress to mean “actions to protect, sustainably manage and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits” (UNEP/IUCN 2021). By definition, nature-based solutions are not a new concept and it is used to describe ecosystems and their functions. Other similar concepts are ecosystem-based adaptation, ecosystem management and ecosystem-based management. But the IUCN’s concept of nature-based solutions is specifically designed as a climate change mitigation strategy.

In keeping with limiting global warming well below 2°C - preferably 1.5°C - the IUCN estimated that nature-based solutions could support a yearly emissions reduction of at least 5 GtCO₂e² by 2030 and 10 GtCO₂e by 2050 effectively cutting back on global CO₂ emissions. But this desired effect must be “backed by rapid ambitious and sustained abatement of fossil fuels and other industrial emissions....



governments must also be committed to decarbonizing their economies with support from civil society” (UNEP/IUCN 2021). Having multiple benefits, allowing synergies, and minimizing trade-offs, these solutions must be carefully designed, implemented and monitored. To help in that effort, the IUCN set the Global Standard for Nature-based Solutions which involves very specific criteria that guide the design, execution, and evaluation of nature-based solutions.

Tietenberg (1996) believed the environment is a composite economic asset that provides several services to ensure the survival of mankind and life on Earth. But as an asset, provisions must be made to preserve its value and address its depreciation, so it can continue

to provide the valuable services that will preserve life on Earth. The by-products of human activities and processes are returned to the environment as waste. In this case, pollutants such as CO₂ can be absorbed by the environment, but only if it has the absorptive capacity to do so (Tietenberg, 1996). Nature-based solutions³ can play a role here, as part of a wider strategy alongside stringent decarbonization initiatives.

Between 1990 and 2019 there is evidence to show a steady increase in greenhouse gases from all sources (See figure 1). These increases demonstrate the need to purposefully design mitigation strategies to meaningfully reduce global CO₂ emissions and other greenhouse gases.

For these nature-based solutions to

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¹ UNFCCC Paris Agreement: <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>

² The carbon dioxide equivalent or CO₂ equivalent is a metric measurement that compares emissions from different greenhouse gases based on their global-warming potential (GWP). Converting greenhouse gases to its carbon dioxide equivalent facilitates the comparison of these emissions with the carbon dioxide equivalent with the same global warming.

³ An example of an effective Nature-based solution would be healthy well managed mangroves would have the potential to reduce the impact of flooding for over 18 million people worldwide, while saving up to US\$57 billion in flood damages in China, India, Mexico, USA and Viet Nam annually (IUCN 2022) <https://www.iucn.org/resources/issues-brief/ensuring-effective-nature-based-solutions>

actively work as part of a mitigation strategy, a holistic multifaceted overarching vision of decarbonization alongside stringent policy measures must be in place. The main objective of these strategies is to absorb CO₂ emissions to the extent that there is an overall net zero emissions target. But the status and health of ecosystems is paramount in determining the absorptive ability of existing ecosystems. Furthermore, knowing the economic value of the various ecosystem services can guide the development of innovative financial instruments, through which these ecosystems could be preserved or rehabilitated to ensure they are functioning at their full capacity, and therefore able to move the subregion and the world towards a net zero CO₂ emission target in the future.

The Green Climate Fund (GCF)⁴ under the Paris Agreement is tailored to serve and support developing countries to assist in the delivery of their Nationally Determined Contributions (NDC), aimed at reducing their GHG emissions while building climate-resilient economies. The UNFCCC has referenced the use of ecosystem services to assist in addressing global warming.⁵ An example of this thrust is a GCF project in Uganda, which is geared towards enhancing the adaptive capacities of their wetlands, to reduce Uganda's contribution to GHGs, assisting in the fight against climate change.⁶

CARIBBEAN INITIATIVES

The Caribbean has engaged in a few similar initiatives. First, Mercer et al (2012) examined the use of ecosystem-based adaptation (EbA) as an avenue through which SIDS could combat

climate change and its impacts. The Millennium Ecosystem Assessment (MEA)⁷ revealed an overall decline in the health of the subregion's ecosystems hampering their ability to deliver well-functioning ecosystem services.

An estimated one-third of Caribbean reefs were threatened by coastal development, sedimentation, and pollution from land-based sources, and over 60 per cent overfishing recorded on its reefs. The subregion's marine environment was further threatened by shipping activities, ineffective management of protected areas and warming sea temperatures. The MEA estimated the annual net economic value of coral reefs and the services they provide to be in the vicinity of US\$3.1 billion, while contributions from fisheries, dive tourism and shoreline protection were approximately US\$4.6 billion. As these subregional ecosystems degrade economic losses are inevitable (Ministry of Planning and Development, GoTT, 2022).

Effective nature-based solutions have also been applied to Disaster Risk Reduction; it offers governments and other stakeholders the opportunity to integrate natural ecosystems into DRR strategies. The Word into

Action: Nature-based Solutions for Disaster Risk Reduction guide provides recommendations on how this can be achieved.⁸

Nationally governments have been applying nature-based solutions to support natural resources management, mitigation, and adaptation to climate change. These are illustrated in the following two examples:

1. The Trinidad and Tobago the Institute of Marine Affairs (IMA) Mangrove Soil Sequestration Assessment, a blue carbon⁹ project, funded by the British High Commission. It facilitates the assessment of the natural capacity of this country's land and coastal ecosystems. Under this project the IMA reported a value for water purification services to be an estimated US\$88 million annually. The Northern Forest Range soil retention services was estimated at US\$622 million annually, and shoreline protection ranged between US\$3 to US\$133 per hectare annually.¹⁰ This project is poised to provide essential data which would determine a concrete monetary value for the carbon storage in Trinidad and Tobago's mangrove forests. This would ultimately inform the preservation, enhancement and integrity of this ecosystem which can be achieved through investment, earning foreign exchange for Trinidad and Tobago and contribute to building its resilience. (Ministry of Planning and Development 2022)

► (continued on page 14)

Figure 3: Caribbean coral reef



(image courtesy Adobe Stock)

⁴ See more: <https://www.greenclimate.fund/about>

⁵ See more: <https://www.greenclimate.fund/story/using-ecosystems-counter-climate-crisis-only-natural#>

⁶ See more: <https://www.greenclimate.fund/story/using-ecosystems-counter-climate-crisis-only-natural#>

⁷ The overall objective of The Millennium Ecosystem Assessment (MEA) was to assess the health of ecosystems and determine how changes to these systems could affect human well-being. The results were used to advise on the conservation and sustainable utilization of these valuable ecosystems (<https://www.millenniumassessment.org/en/About.html#>).

⁸ Words into Action: Nature-based Solutions for Disaster Risk Reduction (undrr.org)

⁹ Blue carbon is the term used to describe coastal and marine ecosystems that could capture and store carbon both within their structure and the sediments below. Research has shown that these systems are capable of storing from two to four times more carbon than terrestrial ones, making these a strong contender as nature-based solutions to combat climate change (Intergovernmental Oceanographic Commission website: <https://ioc.unesco.org/our-work/blue-carbon#:~:text=Blue%20carbon%20ecosystems%20E2%80%93%20mangroves%2C%20tidal,based%20solutions%20to%20climate%20change>). In keeping with this, blue carbon projects are those that assess the reduction in greenhouse gas emissions that can be attributed specifically to the project. These are implemented primarily as climate mitigation strategies (<https://reefresilience.org/management-strategies/blue-carbon/blue-carbon-projects/#:~:text=A%20blue%20carbon%20project%20uses,%2C%20sustainable%20use%2C%20and%20restoration>).

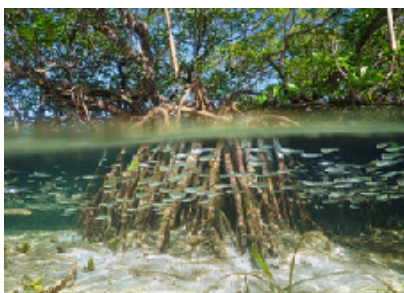
¹⁰ The mangrove forests stand at 7500 hectares and will aid Trinidad and Tobago in its commitment to the Paris Agreement.

NATURE BASED SOLUTIONS: CAN THEY HELP US STAY ALIVE AT 1.5°C? (CONTINUED)

CARIBBEAN INITIATIVES (CONTINUED)

2. Guyana's Low Carbon Development Strategy (LCDS) is geared toward the country's transition to a green economy to combat climate change, while simultaneously promoting economic growth and development. In December 2009, Guyana and Norway entered into an agreement to work together to develop a replicable model for Reducing Emissions from Deforestation and Forest Degradation (REDD+), aligning the development objectives of forest countries with the world's need to combat climate change. Under this project, Norway committed to providing financial support up to US\$250 million until 2015 aimed at limiting emissions from deforestation and forest degradation, supporting the implementation of Guyana's LCDS. (GRIF Factsheet, 2011, LCDS 2010). Guyana continues to develop its LCDS having benefited from the government of Norway's financial support.

Figure 2: Caribbean Mangrove



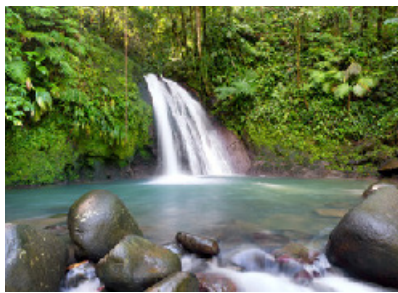
(image courtesy Adobe Stock)

CONCLUSION

Nature-based solutions can be an effective strategy in limiting global warming to well below 2°C - preferably 1.5°C. Since these nature-based solutions can actively absorb CO₂ emissions, their health and absorptive capacity are critical to achieving net zero emissions in the future.

The Caribbean initiatives presented here, although not exhaustive, are representative of the subregion's

Figure 3: Caribbean River



(image courtesy Adobe Stock)

commitment to contributing to the global mitigation effort in fighting the impacts of climate change. The MEA is critical in ascertaining the value and health status of some of the subregion's ecosystems. This, in conjunction with Guyana's LCDS model and the IMA Mangrove Soil Sequestration Assessment - which will reveal a definitive carbon capacity of Trinidad and Tobago's mangroves - will allow for the development of an appropriate policy response to set the subregion onto a resilient net zero path. ■

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