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Blue Carbon Initiatives - Global Status and Way Forward in India

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Abstract

"Blue carbon" describes the capture process of atmospheric carbon dioxide by marine and coastal environments like mangroves, seagrass and salt marshes. Many initiatives have acknowledged the importance of blue carbon, including international accords like the UN Sustainable Development Goals and the Paris Agreement. Numerous projects worldwide and in India have been initiated acknowledging the importance of Blue Carbon. Specifically, in this article Tamil Nadu's leadership in blue carbon efforts is highlighted by indicating the State's efforts in establishing Tamil Nadu Blue Carbon Agency. The necessity of coordinated efforts to maintain and repair these ecosystems for a sustainable future is emphasized, along with the socioeconomic advantages of adopting blue carbon.

Keywords: Blue carbon, Carbon credits, Mangroves, Marine ecosystems

Introduction

Blue carbon means the carbon taken in from the atmosphere and retained by coastal and marine environments like seagrass, mangroves, salt marshes, coral reefs and seaweeds. In order to mitigate climate change and trap carbon dioxide from the atmosphere, these ecosystems are essential. In contrast to salt marshes and seagrass, which store carbon in their sediments and organic matter, mangroves store carbon in their leaves, branches and roots. Mangroves and coastal ecosystems store carbon annually at a ten-fold pace higher than that of mature tropical forests. In comparison to tropical forests, they also fix three to five times as much carbon per unit area. Salt marshes may store up to 500 tons of carbon dioxide ha^{-1} annually; but mangroves can store up to 1,000 tons. In addition to these benefits, Mangroves, salt marshes and seagrass acts as natural buffers against storms and erosion and also these habitats support marine life and they are rich in biodiversity (Nellemann *et al.*, 2009); created the term "blue carbon," The amount of research and characterization of marine ecosystems carbon dynamics has multiplied. An assessment report for a special collaboration between the United Nations Environmental Programme (UNEP), the Food and Agriculture Organisation of the United Nations (FAO), and the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific, and Cultural Organisation (IOC/UNESCO) first introduced the theory of "blue carbon" in 2009 (Alongi, 2020).

Blue Carbon Initiatives - Global Level

Tropical and subtropical coastal regions are native to blue carbon ecosystems globally. Mangrove forests, with the exception of Antarctica, are mostly found in Southeast Asia, Africa and Latin America. While seagrass can be located in shallow coastal waters all over the world, salt marshes are more abundant in temperate and subarctic regions of North America and Europe (Anonymous, 2020). As per Global Forest Resource Assessment (2020) 113 countries have an estimated 14.79 million hectares of mangrove forest (FAO, 2020). Many international accords and policy frameworks like UN Sustainable Development Goals (SDGs) and the Paris Agreement, acknowledge the existence of blue carbon environments. Policy initiatives like carbon pricing plans and REDD+ (Reducing Emissions from Deforestation and Forest

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Degradation) are being researched in order to promote the preservation and restoration of blue carbon environments. Recognizing the relevance of blue carbon, worldwide initiatives are presently in progress to preserve and restore these environments. Reforestation of mangroves, restoration of salt marshes and seagrass meadows are among the initiatives. These initiatives seek to lessen the effects of Climate change, preserve the blue carbon ecosystems that already exist and enhance their capacity to sequester carbon. The global level blue carbon projects are listed in the table 1.

The Global Level Blue Carbon Projects

The Global Blue Carbon Initiatives stands at the forefront of a vital environmental movement, seeking to harness the immense potential of coastal environments in combat against warming globes. With the world's attention increasingly focused on mitigating carbon emissions and preserving biodiversity, these initiatives emerges as a big positive, promoting the environments rich in blue carbon being preserved and restored. Through collaborative research, policy advocacy, and on-the-ground conservation efforts, the initiative aims to unlock the full potential of blue carbon in the global carbon cycle. By engaging stakeholders across sectors and mobilizing international support, it strives to catalyze transformative action towards a more sustainable and resilient future.

Blue Carbon Initiatives in India

In India, mangroves cover about 4,992 km^2, or 0.15% of the entire area of the nation. Net mangrove cover has risen since the 2019 assessment by 17 km^2. The mangroves have the capacity to store an estimated 702.42 million tonnes of CO_2. By 2030, a potential 748.17 million tonnes of CO_2 will be stored. Preserving and protecting mangrove cover might lead

Table 1: List of Blue Carbon projects - Global level

Sl. No.	Project	Year	Country	Implementing Agency	Project Details
1.	Mangrove reforestation project	2010	Kenya	Mikoko Pamoja, Kenya	• First blue carbon project. • 5614 mangrove seedlings planted. • It contributed to Six SDGs.
2.	Mangrove restoration project	2011	Senegal	Livelihoods Funds, France with Océanium (NGO), Senegal	• 79 million trees planted and 7920 hectares restored. • 5,00,000 tonnes of carbon offsets expected.
3.	Mangrove restoration project	2011	Indonesia	Livelihoods Funds, France with Yagasu (NGO), Indonesia.	• 18 million trees planted and 5000 hectares restored. • Two million tonnes of carbon to be sequestered over 20 years. • 20,000 - People impacted by this project.
4.	Blue carbon demonstration project (AGEDI, 2013)	2012	Abu Dhabi	GRID-Arendal (UNEP Partner), Norway with Abu Dhabi Global Environmental Data Initiative (AGEDI)	• It covers an area of 1,76,400 hectares. • The project findings are used in policy-making for sustainable preservation of coastal ecosystems, climate mitigation and developmental plans.
5.	Zambezi Mangrove carbon project	2014	Tanzania and Mozambique	World Wildlife Fund (WWF) -International NGO, Switzerland	• The aim of this initiative is to support Mozambique's REDD+ program. • Provided with the Funding by US Agency for International Development (USAID). • It covers an area of 30,267 hectares.
6.	Delta Blue project	2015	Pakistan	Indus Delta Capital with the Govt. of Sindh, Pakistan	• Largest mangrove restoration project. It covers an area of 3,50,000 hectares. • It contributes to 12 SDGs. • Project lifespan - 60 years, carbon credits - 128.5 million and sequester 142 million tonnes carbon dioxide.
7.	Tahiry honko mangrove carbon conservation project	2018	Madagascar	Blue Ventures, United Kingdom	• This project covers an area of 1,200 hectares and it avoids emissions of 1300 tonnes of carbon dioxide $year^{-1}$. • The world's Largest Community-led project. • It contributes to Seven SDGs. • Project funded by Darwin initiative through UK government.

to an increase in CO_2 sequestration of 207.91 million tonnes. The blue carbon projects in India are listed in the table 2.

Blue Carbon Projects in India

In India, coastal ecosystems are rich and diverse and they play vital roles in carbon sequestration, shoreline protection, and supporting marine biodiversity. Among these ecosystems, mangroves stand out as one of the most effective carbon sinks. Additionally, seagrasses and salt marshes also contribute significantly to carbon storage and coastal resilience. Hence the implementation of Blue Carbon projects holds significant promise for both climate action and biodiversity conservation. India's commitments under international agreements like the Paris Agreement further emphasize the need to enhance carbon sinks and reduce greenhouse gas emissions. India's "blue carbon" initiatives seek to meet local development necessities and improve ecosystem resilience while maximizing the potential of coastal ecosystems to sequester carbon.

Tamil Nadu - National Forerunner in Blue Carbon Initiative

Tamil Nadu is leading the way in India's Blue Carbon project, with the state government having issued orders to carry out the Tamil Nadu Coastal Restoration Mission Focusing on 14 coastal districts in the State for the five years at a cost of ₹ 1,675 crores with World Bank support. The State would pay an estimated ₹ 502.5 crores while the World Bank will contribute ₹ 1,172.5 crores for the operations that will take place between 2024 and 2029. Projects to increase coastal biodiversity, enhance coastal livelihood through sustainable practices and reduce plastic waste in marine ecosystems are all part of the objective. To monitor the restoration of mangroves and seagrass, limit erosion, restore the corals in the Kariyachalli Islands of the Gulf of Mannar environment and fortify coastal management systems, a Tamil Nadu Blue Carbon Agency (TNBCA) would be developed. This will be the fourth state government mission, following the Tamil Nadu Green, Tamil Nadu Wetlands and Tamil Nadu Climate missions and the first of its kind to focus on a Blue Green economy that is resilient to climate change with coastal communities. It will be led by the Tamil Nadu Green Climate Company. The project will build a structure for the beneficial trading of carbon credits for the benefit of nearby communities. A steering committee with significant authority has been established. The Secretaries of twelve departments, including environment, climate change and forests; finance; planning, development and special initiatives; water resources department; fisheries; tourism, culture and religious endowments; municipal administration and water supply, will be its members. The Chief Secretary will serve as its head. Members include the Chief Wildlife Warden and the Principal Chief Conservator of Forests. The Chief Mission Director will convene a meeting of the committee.

Table 2: List of Blue Carbon projects - India

Sl. No.	Project	Year	State	Implementing Agency	Details
1.	Enhancing Climate Resilience of India's Coastal Communities	2019	Maharashtra, Andhra Pradesh and Odisha	Green Climate Fund(GCF), South Korea and the Ministry of Environment, Forest and Climate Change (MoEFCC), India	• It is carried out in 24 target ecosystems in 12 coastal districts. • The project cost - (USD) is $ 130.30 million. • It is done through Ecosystem-based Adaptation. • Its aim is to improve the resilience of marginalized coastal communities.
2.	Mangrove Restoration blue carbon project	2023	Gujarat	Saline Area Vitalization Enterprise Limited (SAVE), Gujarat Ecology Commission (GEC)	• 40 potential sites selected and it covers an area of 20,000 hectares. • The largest blue carbon project in India. • This project involves the marginalized coastal communities.

Conclusion

The significance of blue carbon to humans is wide-ranging and profound. The potential of blue carbon in mitigating climate change has garnered global attention and also provides enormous advantages to human communities all over the world. Seagrass mapping is lacking in India, while tidal salt marshes have received no surveying at all. Surveys and mappings of these two carbon reservoirs are required for effective carbon sequestrations; Nationally Determined Contributions (NDCs) of the nations with major coastlines. carbon credits have the potential to provide not only environmental benefits but also significant socio-economic advantages for local communities, particularly in developing regions. In addition to offering chances for addressing climate change, embracing the idea of "blue carbon" encourages socioeconomic growth, resilience and biodiversity preservation, all of which work together to create a future that is more sustainable for people and the environment.

> "*Blue carbon is integrally associated with people's lives and goes beyond carbon trading and measurement*."

References

AGEDI, 2013. The Abu Dhabi Blue Carbon Demonstration

Project: Blue Carbon in Abu Dhabi - Protecting our coastal heritage. AGEDI, Arendal. pp. 16-31. Available at: https://www.grinda.no/publications/181. Accessed on: 12th February, 2024.

Alongi, D.M., 2020. Global significance of Mangrove Blue Carbon in climate change mitigation. *Sci* 2(3), 67. DOI: https://doi.org/10.3390/sci2030067.

Anonymous, 2020. About Blue Carbon. In: *The Blue Carbon Initiative*. Available at: https://www.thebluecarboninitiative.org/about-blue-carbon. Accessed on: 10th February, 2024.

FAO, 2020. Global Forest Resources Assessment 2020: Main report. FAO, Rome, Italy. p. 184. DOI: https://doi.org/10.4060/ca9825en.

Nellemann, C., Corcoran, E., Duarte, C.M., Valdés, L., De Young, C., Fonseca, L., Grimsditch, G., 2009. Blue Carbon. *A Rapid Response Assessment*. United Nations Environment Programme, GRID-Arendal. pp. 35-68.