Blue carbon credits: a lot of promises but even more uncertainties for the Global South

A. Comte, Marie-Christine Cormier-Salem, Patrice Guillotreau, Sylvie Manouvrier, Christophe Proisy, R. Chabrol, I. Sakho, M. L. G. Soares, C. M. Agraz Hernandez

POLICY BRIEF

COP28 UAE

RÉPUBLIQUE FRANÇAISE
Liberté
Égalité
Fraternité

Institut de Recherche pour le Développement
FRANCE
French National Research Institute for Sustainable Development

Blue carbon credits: a lot of promises but even more uncertainties for the Global South

SUMMARY

Sustainable science, socio-environmental justice and equity will determine the necessary co-benefits for the credibility, acceptability and effectiveness of blue carbon credits. The blue carbon market must not distract policy-makers from the goal of urgent and massive emission reductions in the Global North. It must be demonstrated that it effectively sequesters and stores carbon everywhere, but also that it is equitable and inclusive in and with the Global South. For this to happen, blue carbon finance strategies must be co-designed with all stakeholders, with a particular attention to the most vulnerable people in the Global South. More globally, an integrated approach addressing carbon storage but also adaptation capacities, biodiversity conservation and benefits for the communities is to be preferred.

KEY FACTS AND FIGURES

- Mangroves provide important contributions for the livelihoods of over **120 million** people
- By reducing the risks of coastal erosion, flooding, cyclones and storm surges, marine and coastal ecosystems protect not only **millions** of people, but also economic infrastructures and value chains
- Marine and coastal ecosystems store up to **three to five times** the amounts of carbon stored by an equivalent area of tropical land-based forest
- Anthropogenic activities and climate change affect **3%** of the surface area of blue carbon coastal ecosystems per year

CONTEXT

BLUE CARBON CREDITS ARE BOOMING, BUT THEIR IMPACTS ARE STILL UNCLEAR

Blue carbon has been defined by the IPCC as the capacity of marine and coastal ecosystems to store organic carbon over centuries or even millennia. Such ecosystems include mangroves, salt marshes and seagrass meadows, and potentially in the future pelagic ecosystems that compose the biological carbon pump. Over 120 million people, notably women, rely on those biodiversity hotspots to live, eat or earn money. Yet, most of these ecosystems are under threats from human activities: growing urbanisation, intensive fishing and aquaculture, widespread pollution, etc.

COP 28
Nov. 2023

At the same time, the voluntary carbon market has been booming. 255 million of credits have been issued in 2022 for almost US$2 billions, a 4 to 6X increase compared to 2019[1]. This mechanism allows companies to buy credits from projects that store carbon or avoid emissions in order to offset their own GHG emissions and fulfil their Corporate Social Responsibility commitments. While the majority of these credits are generated by projects that reduce emissions from deforestation and forest degradation, a growing part comes from blue carbon projects. They are seen as a unique opportunity to limit global warming, preserve biodiversity and contribute to local development. Nevertheless, such projects are still uncertain and risky. It is unclear whether this new form of commodification of ecosystem services will promote carbon sequestration in the long term and have a positive impact on local people.

FINDINGS

BLUE CARBON ECOSYSTEMS DEPEND ON A COMPLEX MIX OF SOCIO-ENVIRONMENTAL PARAMETERS

Carbon storage and fluxes in blue carbon ecosystems depend on local characteristics such as geomorphic conditions, biogeochemical properties of the seawater but also sedimentary and oceanic processes. They are subject to marine and climate risks such as drought, sea level rise and fall, extreme storms, rising ocean temperatures and are strongly influenced by any anthropogenic source of pollution. Carbon storage and fluxes in marine and coastal ecosystems are thus very difficult to assess.

These ecosystems are also subject to different types of land tenure, rights of access and use, traditional forms of governance, conservation statuses. They support a wide range of local economic activities: fishing, livestock, agriculture, forestry, etc.

Blue carbon projects linked to land grabbing practices in Brazil

Pristine Rhizophora mangroves in the Lago Piratuba Biological Reserve, Cabo Norte, Amapá , Brazil (credit photo Christophe Proisy, 2011)

In Brazil, around 80% of mangrove forests are located in public protected areas (federal, state or municipal), most of which are defined as extractive reserves, a category of protected area where the conservation of the natural system, and therefore the carbon stock, depends on shared management between public authorities and traditional communities. However, several companies linked to the carbon market have harassed traditional communities living in these areas and violated their rights in a form of land grabbing. In 2022, Confrem – the National Commission for the Strengthening of Extractive Reserves and Coastal Marine Extractive Peoples, which represents most of the traditional communities associated with Brazil's mangroves – published a document calling for prior, free and informed consultation, the guarantee of community protocols and territorial rights for local people.

THE REAL IMPACTS OF BLUE CARBON PROJECTS ARE UNCERTAIN AND DEPEND ON THE WAY DRIVERS ARE ADDRESSED

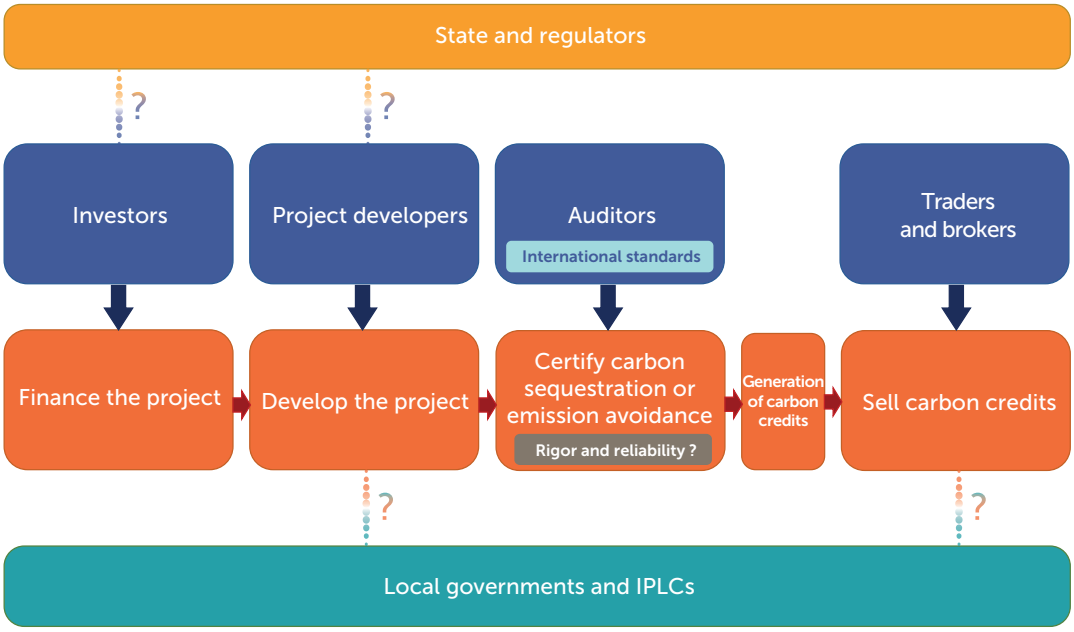
Funding the extensive planting of a single mangrove species without careful prior analysis of the specific parameters of each site and future climate scenarios is very likely to fail. Understanding the local drivers of blue carbon ecosystems' degradation is key, e.g. deficit or lack of the tidal immersion and emersion conditions regularity, poor quality of interstitial water on mudflats, sedimentation conditions, deforestation, etc. In particular, mudflats must be preserved as they are key for the functioning and balance of the mangrove ecosystem and in the coastal food web.

It has been observed in a number of regions such as Senegal[2], West Papua in Indonesia[3], Brazil[4], Costa Rica[5], Benin[6], México[7] or French Guiana[8] that undisturbed mangroves can flourish again by themselves without replanting. On the contrary, many plantation projects have failed because of a lack of understanding of local parameters – either in degraded mangroves or in other areas unsuitable for mangroves, such as salt flats or freshwater marshes.

BLUE CARBON MARKETS: A HIGHLY STANDARDISED SYSTEM INVOLVING MULTIPLE STAKEHOLDERS

Many public and private organisations from the global North invest in blue carbon projects, mainly in the Global South, to offset their GHG emissions. Such projects are designed by "project developers", in accordance with international standards. These projects can issue carbon credits following an assessment of the quantity of carbon stored or emissions avoided. However, this assessment is often based on methods and inventories which lack rigor and reliability.

Valuation of those credits on the voluntary carbon market is opaque and highly variable: from 6 to 30 dollars per ton of CO_2eq. These credits are eventually sold on international markets and certified by third parties. In a nutshell, blue carbon markets involve a diversity of intermediaries from the global North – investors, project developers, auditors, certifiers – with a financial and sometimes short-term vision. These stakeholders can be far from the needs, complexities and long-term resilience of blue carbon ecosystems and associated indigenous peoples and local communities.



Simplified illustration of the multiple stakeholders involved in blue carbon finance

THE COMPLEXITY AND STANDARDISATION OF BLUE CARBON MARKETS MAKES IT DIFFICULT TO ENGAGE WITH LOCAL PEOPLE

There is a tension between, on the one hand, a global market with international rules and on the other hand, local contexts, needs and specificities. Although local people may be involved in blue carbon projects for communication purposes, they are under-represented in their design, governance and ultimately in the equitable distribution of benefits (when blue carbon credits are sold on the market). They can even be prevented from working in the newly "preserved" or "restored" areas. There are now certifications that attempt to account for these issues, including Verra's Climate Community and Biodiversity (CCB) standard or Plan Vivo, but these attempts seem marginal in the global markets. In addition, the multiplication of local blue carbon projects and the lack of national or regional regulatory frameworks call for a strategic vision and planning of blue carbon f projects. Global South countries should be encouraged to develop regulations that address the environmental and social risks and maximise socio-environmental co-benefits.

"Plant your tree": successes and failures of a participatory mangrove restoration project in Senegal

Failed replantation of mangrove species in Saloum delta, Senegal (credit photo MC Cormier-Salem, 2013)

In Senegal, between 2009 and 2011, the participatory mangrove restoration project "Plant Your Tree", which aimed at generating carbon credits, failed to properly consider local knowledge and experience or to involve local people in decision-making. Although many villagers were paid to transplant mangrove propagules, they did not participate in the selection of reforestation sites, species or transplanting techniques or period, which are key for the success of replantation. Eventually, they lost their access and use rights over the reforested areas and the replantation failed. Drawing lessons from existing projects and the recommendations of a platform of experts, the French Facility for Global Environment (FFEM) is now promoting in-depth socio-ecological diagnoses in the projects it supports, particularly in Senegal, prior to their implementation.

MULTI-STAKEHOLDER DIALOGUE PLATFORMS CAN HELP DEALING WITH THE SOCIO-ENVIRONMENTAL COMPLEXITY OF BLUE CARBON ECOSYSTEMS

At the international level, improved connections between climate and biodiversity conventions (UNFCCC and CBD) and associated international scientific panels (IPCC and IPBES) should be encouraged. Negotiations under UNFCCC and mitigation scenarios of the IPCC should consider the preservation and restoration goals of the Global Biodiversity Framework. Explicit links should be made between these goals and their impacts on the capacity of ecosystems to sequester and store carbon, for instance in Nationally Determined Contributions. This would facilitate the

integration of climate and biodiversity issues, addressing ecosystems not only as carbon sinks or sources but also, equally importantly, as biodiversity hotspots. Global initiatives like the International Partnership for Blue Carbon (IPBC) are trying to address this.

At the regional level, fostering the dialogue between decision makers, scientists and the civil society is key to ensure that preservation or restoration projects in blue carbon ecosystems are respectful of the SDGs. For instance, the Nairobi Convention successfully involves governments, civil society and the private sector in a common dialogue to improve Western Indian Ocean's sustainability.

At the local level, people, thanks to customary modes of governance, have used and preserved blue carbon ecosystems for centuries. This traditional knowledge and know-how must be internationally recognized and inform preservation strategies and frameworks. Progressive ways of collaborative planning are being experimented with the emerging living lab approach. For instance, MAGELLAN, a living lab project on the mangroves of French Guiana, was particularly well received by local stakeholders, who understood that a better knowledge of the complex functioning of mangroves could help address major socio-environmental challenges in French Guiana.

Fisherman in the mangrove of Cassurubá Extractive Reserve, Bahia, Brazil (credit photo NEMA / UERJ)

Shell fishing in Saloum Delta, Senegal (credit photo MC Cormier-Salem, 2011)

REDUCING GHG EMISSIONS AND INCREASING CLIMATE FINANCE FOR ADAPTATION: TWO PRIORITIES TO PRESERVE BLUE CARBON ECOSYSTEMS IN THE LONG TERM

If global warming exceeds 2°C, mangroves and salt marshes may not be able to adapt and survive. Meanwhile, blue carbon credits allow Northern companies to offset, in a very uncertain way, their GHG emissions. In order to avoid tipping points, blue carbon finance projects must be coupled with ambitious plans to reduce emissions, especially from the largest historical Northern emitters, and should follow the most demanding guidelines in this matter.

Today, Global South countries and especially Small Islands and Developing States are very exposed and vulnerable to the consequences of climate change. They are asking for more financing from the global North, which is historically responsible for climate change, to cover their mitigation and adaptation needs and socioeconomic damages. In this global context, international funds should focus primarily on adaptation plans.

CONCLUSION:

MITIGATION BEFORE RESTORATION; CONTRIBUTION RATHER THAN OFFSETTING

An unprecedented and international effort to better characterise not only blue carbon storage capacity, but also carbon fluxes under climate change pressure, needs to be organised as soon as possible. This is urgently needed to avoid the creation of a financial bubble, inflated by unfair and inequitable North-South offsetting and commodification practices with very low reliability of measurements

and impacts, but also a race to planting mangroves everywhere. Instead, attention must be paid to the preservation of the functions of marine and coastal ecosystems, especially mudflats.

To be consistent with SDGs, blue carbon projects must carefully involve indigenous peoples and local communities - especially the most vulnerable such as women and young people - in their design, governance and benefit sharing mechanisms. Their knowledge, know-how, uses and rights over coastal ecosystems and mangroves in particular must be recognized and respected.

Last but not least, blue carbon finance projects must be coupled with ambitious measures to mitigate climate change effects and biodiversity loss. Governments and industries that are the biggest GHG emitters must first and foremost reduce their emissions and finance adaptation. This is the most efficient way to preserve blue carbon ecosystems in the long run.

RECOMMENDATIONS

Investors and donors, including Development Finance Institutions, should

- Support projects issuing high-quality credits, i.e. addressing environmental and social risks and maximizing co-benefits for local communities and biodiversity with the best existing standards
- Refer to the most demanding principles and standards regarding the integrity of the demand (Oxford principles, VCMI)
- Ensure carbon finance projects contribute to the implementation of the Paris Agreement on top of other non-financial mechanisms
- Encourage and support local expertise

Blue carbon project developers should:

- Assess blue carbon storage and fluxes on rigorous and sound scientific basis
- Ensure free, prior and informed consent from local people, involve them in the projects' co-design, governance and benefit-sharing processes and recognize their knowledge, know-how and rights
- Prioritise conservation and ecological restoration projects which address the root causes of degradation and allow for natural ecosystem regeneration instead of replanting, which is more uncertain and takes a long time to deliver impact
- Establish multi-stakeholder blue carbon dialogue platforms between decision makers, researchers and civil society at the global, regional and local scales
- Adopt a global SDG approach to maximize social and biodiversity benefits and reinforce the quality and integrity of blue carbon finance projects

All of the above should be set as prerequisites by Article 6 of the Paris agreement and considered in international standards and certification processes.

Global North countries should in priority:

- Reduce GHG emissions and meet the funding gap for adaptation

Global South Countries should:

- Prepare the implementation of article 6 of the Paris Agreement
- Ensure free, prior and informed consent from local people and secure territorial use and access rights in mangroves for Indigenous People and Local Communities, and particularly for the most vulnerable
- In accordance with the Global Biodiversity Framework, encourage the development of protected areas in blue carbon ecosystems areas

REFERENCES

1 Bloomberg, Long Term Carbon Offsets Outlook, 2023

2 Ndoye, A. R. (2023). Indicateurs d'efficacité de restauration des mangroves au Sénégal. Université Cheikh Anta Diop de Dakar (Sénégal). PhD in progress.

3 Sasmito, S.D., Sillanpää, M., Hayes, M.A., Bachri, S., Saragi-Sasmito, M.F., Sidik, F., Hanggara, B.B., Mofu, W.Y., Rumbiak, V.I., Hendri, Taberima, S., Suhaemi, Nugroho, J.D., Pattiasina, T.F., Widagti, N., Barakalla, Rahajoe, J.S., Hartantri, H., Nikijuluw, V., Jowey, R.N., Heatubun, C.D., zu Ermgassen, P., Worthington, T.A., Howard, J., Lovelock, C.E., Friess, D.A., Hutley, L.B., & Murdiyarso, D. (2020). Mangrove blue carbon stocks and dynamics are controlled by hydrogeomorphic settings and land-use change. Global Change Biology, 26, 3028-3039. https://doi.org/10.1111/gcb.15056.

4 Diniz, C., Cortinhas, L., Nerino, G., Rodrigues, J., Sadeck, L., Adami, M., & Souza, P.W.M. (2019). Brazilian Mangrove Status: Three Decades of Satellite Data Analysis. Remote Sensing, 11, 808. http://doi.org/10.3390/rs11070808.

5,6 Agraz Hernández, CM, Reyes Castellanos, JE, Osti Saénz, J., Chan Keb, CA, Chávez Barrera J., Etienne J. (2023). Restauración, conservación y manejo sostenible de los manglares de Costa Rica y Benin frente al cambio climático. Universidad Autónoma de Campeche. Instituto EPOMEX. Fonds Français pour l'Environnement Mondial. Sistema Nacional de Áreas de Conservación, Costa Rica.

7 López-Portillo, J., Lewis, R. R., Saenger, P., Rovai, A., Koedam, N., Dahdouh-Guebas, F., Agraz-Hernández, C.M., Rivera-Monroy, V. H. (2017). Mangrove forest restoration and rehabilitation. Mangrove Ecosystems: A Global Biogeographic Perspective: Structure, Function, and Services, 301-345.

8 Proisy, C., Walcker, R., Blanchard, E., Gardel, A., & Anthony, E.J. (2021). Mangroves: a natural early warning system of erosion on open muddy coasts in French Guiana. In D. Friess, & F. Sidik (Eds.), Dynamic Sedimentary Environment of Mangrove Coasts (pp. 47-63): Elsevier. https://doi.org/10.1016/B978-0-12-816437-2.00011-2.

AUTHORS

Comte, A. (IRD), Cormier-Salem, M.-C. (IRD), Guillotreau, P. (IRD), Manouvrier, S. (IRD), Proisy, C. (IRD), Chabrol, R. (AFD), Sakho, I. (Université Amadou Mahtar Mbow), Soares, M. L. G. (Rio de Janeiro State University - UERJ), Agraz Hernández, C. M. (Universidad Autonoma de Campeche)