IUCN

Coastal "blue" carbon

A revised guide to supporting coastal wetland programs and projects using climate finance and other financial mechanisms

CONSERVATION INTERNATIONAL

Duke NICHOLAS INSTITUTE FOR ENVIRONMENTAL POLICY SOLUTIONS Celebrating 10 Years

The Nature Conservancy

Wetlands INTERNATIONAL

FOREST TRENDS

Coastal "blue" carbon

A revised guide to supporting coastal wetland programs and projects using climate finance and other financial mechanisms

This revised report has been written by D. Herr and, in alphabetic order, T. Agardy, D. Benzaken, F. Hicks, J. Howard, E. Landis, A. Soles and T. Vegh, with prior contributions from E. Pidgeon, M. Silvius and E. Trines.

Citation: Herr, D. T. Agardy, D. Benzaken, F. Hicks, J. Howard, E. Landis, A. Soles and T. Vegh (2015). *Coastal "blue" carbon. A revised guide to supporting coastal wetland programs and projects using climate finance and other financial mechanisms*. Gland, Switzerland: IUCN.

ISBN: 978-2-8317-1762-3
DOI: http://dx.doi.org/10.2305/IUCN.CH.2015.10.en

Cover photo: Guinea-Bissau / IBAP
Back cover: Conservation International

Layout by: Dorothée Herr

Available from: IUCN (International Union for Conservation of Nature)
Global Marine and Polar Programme
Rue Mauverney 28
1196 Gland
Switzerland
Tel +41 22 999 02 17
Fax +41 22 999 00 25
www.iucn.org/publications

About IUCN

IUCN, International Union for Conservation of Nature, helps the world find pragmatic solutions to our most pressing environment and development challenges.

IUCN's work focuses on valuing and conserving nature, ensuring effective and equitable governance of its use, and deploying nature-based solutions to global challenges in climate, food and development. IUCN supports scientific research, manages field projects all over the world, and brings governments, NGOs, the UN and companies together to develop policy, laws and best practice.

IUCN is the world's oldest and largest global environmental organization, with more than 1,200 government and NGO Members and almost 11,000 volunteer experts in some 160 countries. IUCN's work is supported by over 1,000 staff in 45 offices and hundreds of partners in public, NGO and private sectors around the world. www.iucn.org

About Conservation International

Building upon a strong foundation of science, partnership and field demonstration, CI empowers societies to responsibly and sustainably care for nature, our global biodiversity, for the wellbeing of humanity.

CI's work focuses on creating a healthy, prosperous world in which societies are forever committed to caring for and valuing nature, for the long-term benefit of people and all life on Earth.

Founded in 1987, CI has headquarters in the Washington, DC area, and nearly 900 employees working in more than 30 countries on four continents, plus 1,000+ partners around the world. www.conservation.org

About Wetlands International

The mission of Wetlands International is to safeguard and restore wetlands for people and nature. Wetlands International is an independent, non-profit organisation, active in around 100 countries, which works through a network of many partners and experts to achieve its goals.

We are driven by the knowledge that safeguarding and restoring wetlands is urgent and vital for water security, biodiversity, climate regulation, sustainable development and human health. www.wetlands.org

About The Nature Conservancy

The Nature Conservancy is a leading conservation organization working around the world to conserve the lands and waters on which all life depends. The Conservancy and its more than 1 million members have protected nearly 120 million acres worldwide. www.tnc.org

About Forest Trends

Forest Trends is a Washington D.C.-based international non-profit organization that was created in 1998 by leaders from conservation organizations, forest products firms, research groups, multilateral development banks, private investment funds and philanthropic foundations.

Forest Trends seeks to shift the economic paradigm towards recognizing the value in all natural ecosystems, connecting policy-makers, businesses, communities, and investors to develop new financial tools to help carbon, biodiversity, and water markets work for conservation and sustainability.

Its Marine Ecosystem Services (MARES) Program aims to protect crucial marine ecosystem services by harnessing markets and private sector investment, in order to complement conventional coastal and marine management and safeguard human well-being.

www.forest-trends.org

About the Nicholas Institute for Environmental Policy Solutions at Duke University
The Nicholas Institute for Environmental Policy Solutions at Duke University improves environmental policymaking worldwide through objective, fact-based research to confront the climate crisis, clarify the economics of limiting carbon pollution, harness emerging environmental markets, put the value of nature's benefits on the balance sheet, develop adaptive water management approaches, and identify other strategies to attain community resilience. The Nicholas Institute is part of Duke University and its wider community of world-class scholars. This unique resource allows the Nicholas Institute's team of economists, scientists, lawyers, and policy experts not only to deliver timely, credible analyses to a wide variety of decision makers, but also to convene these decision makers to reach a shared understanding regarding this century's most pressing environmental problems.
www.nicholasinstitute.duke.edu

Disclaimer

This report builds on the "Keep it Fresh or Salty. An Introductory guide to financing wetland carbon projects and programs" (2014). While the 2014 report was more broadly developed for "fresh and salty" wetlands – for inland, terrestrial wetlands and peatlands as well as for coastal wetlands such as mangroves, saltmarshes and seagrasses – this revised report has a specific focus on the latter.

While the extended and updated information available in this report is still relevant for peatlands and other types of carbon-rich freshwater wetlands, this report addresses specific coastal wetland issues for example in the context of Marine Spatial Planning (MSP) and Integrated Coastal Zone Management (ICZM).

Compared to the 2014 report, this extended version is also emphasizing other finance avenues which can link and complement carbon activities with non-carbon based sources of financing from the coastal and marine angle, such as payments for ecosystem services, the use of insurance schemes or debt-for-nature swaps.

This report addresses financing opportunities for coastal ecosystems which are often referred to as "Blue Carbon". Since many international finance mechanisms do not recognize such terminology, the report refers to the coastal "Blue Carbon" systems (mangroves, saltmarshes and seagrasses) as coastal carbon wetlands and addresses them as part of the Land-Use, Land Use Change and Forestry (LULUCF) sector as applied under the UNFCCC.

Acknowledgments

IUCN is grateful for the contribution from the GEF Blue Forest project. The Blue Forests Project is a global initiative focused on harnessing the values associated with coastal marine carbon and ecosystem services to achieve improved ecosystem management. The project is implemented by the United Nations Environment Programme (UNEP) with partners worldwide and addresses key 'blue forests' knowledge gaps, as well as providing experience and tools to help ensure greater global application in the future.

Tundi Agardy and Frank Hicks are grateful to the John D. and Catherine T. MacArthur Foundation for supporting MARES' work in blue carbon in Latin America.

The report is also part of the efforts of the Blue Carbon Initiative, the first integrated program with a comprehensive and coordinated global agenda focused on mitigating climate change through the conservation and restoration of coastal marine ecosystems.

The report, in its entirety or specific sections, has been kindly reviewed by

Gerard Bos, Director, Global Business and Biodiversity Programme, IUCN

Stephen Edwards, Senior Programme Manager, Global Business and Biodiversity Programme, IUCN

Femke Tonneijck, Project Manager Mangrove Capital, Wetlands International

Brian Murray, Director of the Environmental Economics Program at Duke University's Nicholas Institute for Environmental Policy Solutions

Linwood Pendleton, International Chair of Excellence, AMURE-LABEX-IUEM and Senior Scholar of Ocean and Coastal Policy at Duke University's Nicholas Institute for Environmental Policy Solutions

Mike Beck, Lead marine scientist for The Nature Conservancy and an adjunct Professor in Ocean Sciences at the University of California-Santa Cruz

Kathy McLeod, Director, Climate Risk & Resilience at The Nature Conservancy

Rob Weary. Senior Director, Product Development The Nature Conservancy

Andrew Soles, Senior Business Advisor of The Nature Conservancy

Patrick Maguire, Programme Manager, Business and Biodiversity Offsets Programme (BBOP), Forest Trends

The previous report "Keep it Fresh or Salty. An Introductory guide to financing wetland carbon projects and programs" (2014), on which this publication builds on has also been made possible from the Sustainable Peatlands for People and Climate project, financed by Norad, and implemented by Wetlands International.

Comments and reactions to the paper are very welcome.

Please address to dorothee.herr@iucn.org

Table of contents

1 Introduction

Posidonia Seagrass Meadow
© IUCN/ Otero

Coastal wetlands have been the focus of conservation and restoration efforts for over a century with the goal of preserving biodiversity and generating benefits to local communities. A diverse portfolio of financing sources has been used for supporting conservation and restoration activities including philanthropy, multi- and bilateral aid, in-country governmental funding, tourism-related and other usage fees, and fees and levies associated with wetlands-centric extractive industries (e.g. peat extraction). More recently coastal wetlands have also been recognized for their carbon storage and sequestration value, and conversely the emissions released when these ecosystems are degraded or destroyed, opening the door for wetland managers to explore funding sources directed towards climate mitigating efforts.

Governments, international actors (NGOs and academia) and local communities around the world are now increasingly supporting coastal wetland restoration and conservation as a climate change mitigation strategy. Many countries have made reference to these systems and their role in climate mitigation, as well as adaptation, in their Intended Nationally Determined Contribution (INDCs) submitted prior to the creation of a new international climate agreement planned to be adopted by the Conference of the Parties (COP) of the United Nations Framework Convention on Climate Change (UNFCCC) in Paris, France (2015). Better carbon management of coastal wetlands (mangroves, salt marshes and seagrass meadows) will not only enhance carbon sequestration and avoid greenhouse gas (GHG) emissions, but also provide co-benefits to local communities and biodiversity, creating a win-win.

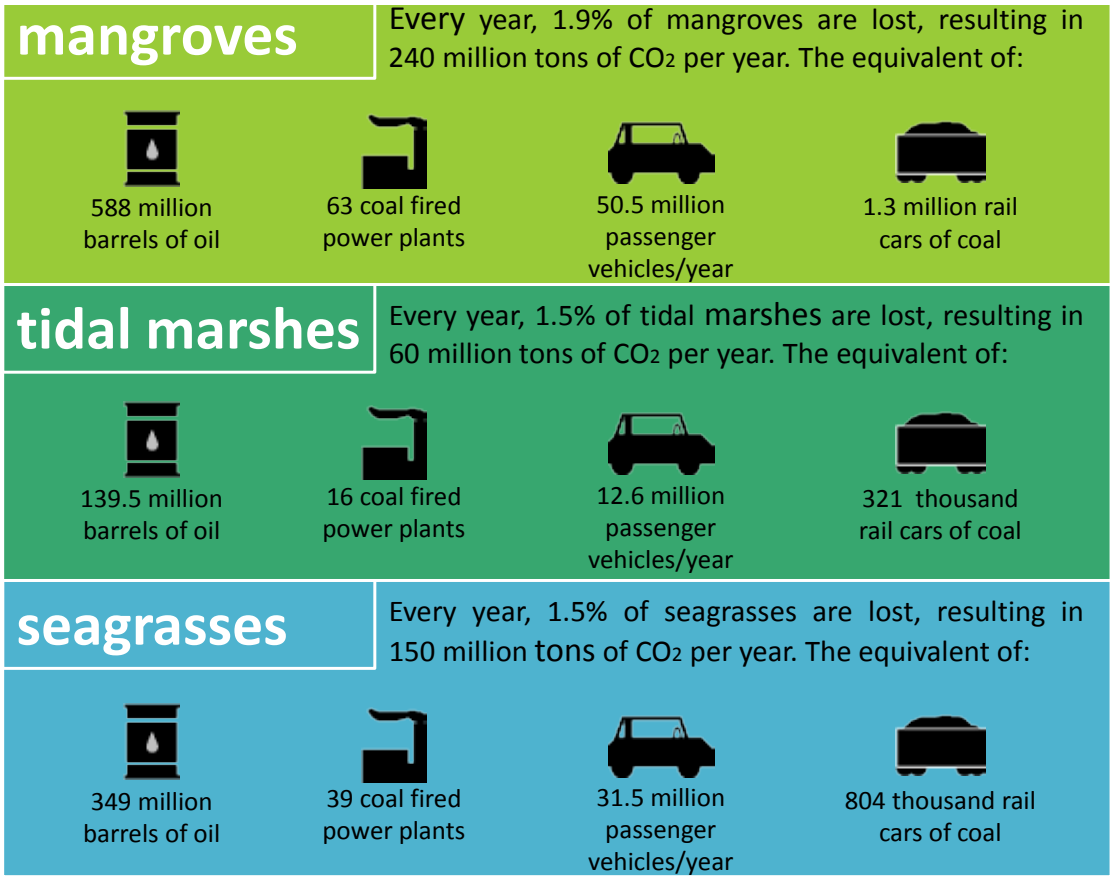
Unlike in the case of terrestrial ecosystems, supporting conservation and restoration of coastal wetlands (as well as for peatlands in general) through financial mechanisms for climate change mitigation is only just emerging. **Finding appropriate funding sources to set up a coastal wetland carbon project or develop a national carbon program (which includes or is solely focused on coastal wetlands) is often a challenge. Additionally, carbon finance alone often cannot support the necessary management activities.**

The report “Keep it Fresh or Salty. An Introductory guide to financing wetland carbon projects and programs” (2014) is an introductory guide to wetland carbon finance. Here we update the report using revised guidance for program and project developers (governments, NGOs, local communities)

working in developing countries on the numerous funds and finance mechanisms that can provide carbon finance for wetland carbon conservation and restoration. **And extended focus in this version is put on other finance avenues which can link and complement carbon activities with non-carbon based sources of financing such as debt-for-nature swaps.**

While this report widens the portfolio of financing streams compared to what has been covered in the 2014 edition, it does not recommend one mechanism over any other, and users of this guide are encouraged to think holistically about the range of benefits provided by coastal wetlands conservation for climate mitigation and adaptation in order to optimize the range of financial mechanisms available.

Figure 1. Comparative analysis of wetland carbon stocks and emissions



2 Achieving more than one goal: Linking conservation, mitigation, and adaptation of wetlands

2.1 Value of coastal wetlands

Coastal wetlands are some of the most endangered habitats on the planet, despite providing valuable climate adaptation services such as flood attenuation and wastewater treatment services, erosion control, buffering against sea level rise and storm damage. They also support biodiversity, and have significant social, socio-economic and environmental co-benefits. In the context of climate mitigation, coastal wetlands have tremendous quantities of carbon stored in the vegetation and soil (Fig. 1) that gets released when the system is degraded or destroyed, and have, in recent years, received increased attention for playing an important role in reducing or offsetting GHG emissions (Fig. 2). Thus management activities that improve the health and sustainability of coastal wetlands have the potential to impact all of the ecosystem services they provide making them well suited for mitigation and adaptation funding as well as a combination of the two.

Coastal wetland management activities meant to restore and conserve wetlands range from rewetting and water management activities to revegetation/reforestation and water quality enhancement efforts.

Further details and a list of wetland restoration and conservation activities for climate change mitigation can be found in the 2014 edition.

However, perhaps the most prominent coastal wetland conservation activities are marine protected areas (MPAs) (no take and zoned for multiple use) and national level marine spatial planning (MSP) strategies (key areas for biodiversity and ecosystem services are identified and zoned based on the most sustainable use of marine and coastal environments). Particularly germane to this discussion of conservation finance for coastal wetlands is the opportunity that exists within MSP initiatives to allocate specific zones within a spatial plan that allow for financial mechanisms like Payment for Ecosystem Services (PES) or Offset Areas (see Section 8).

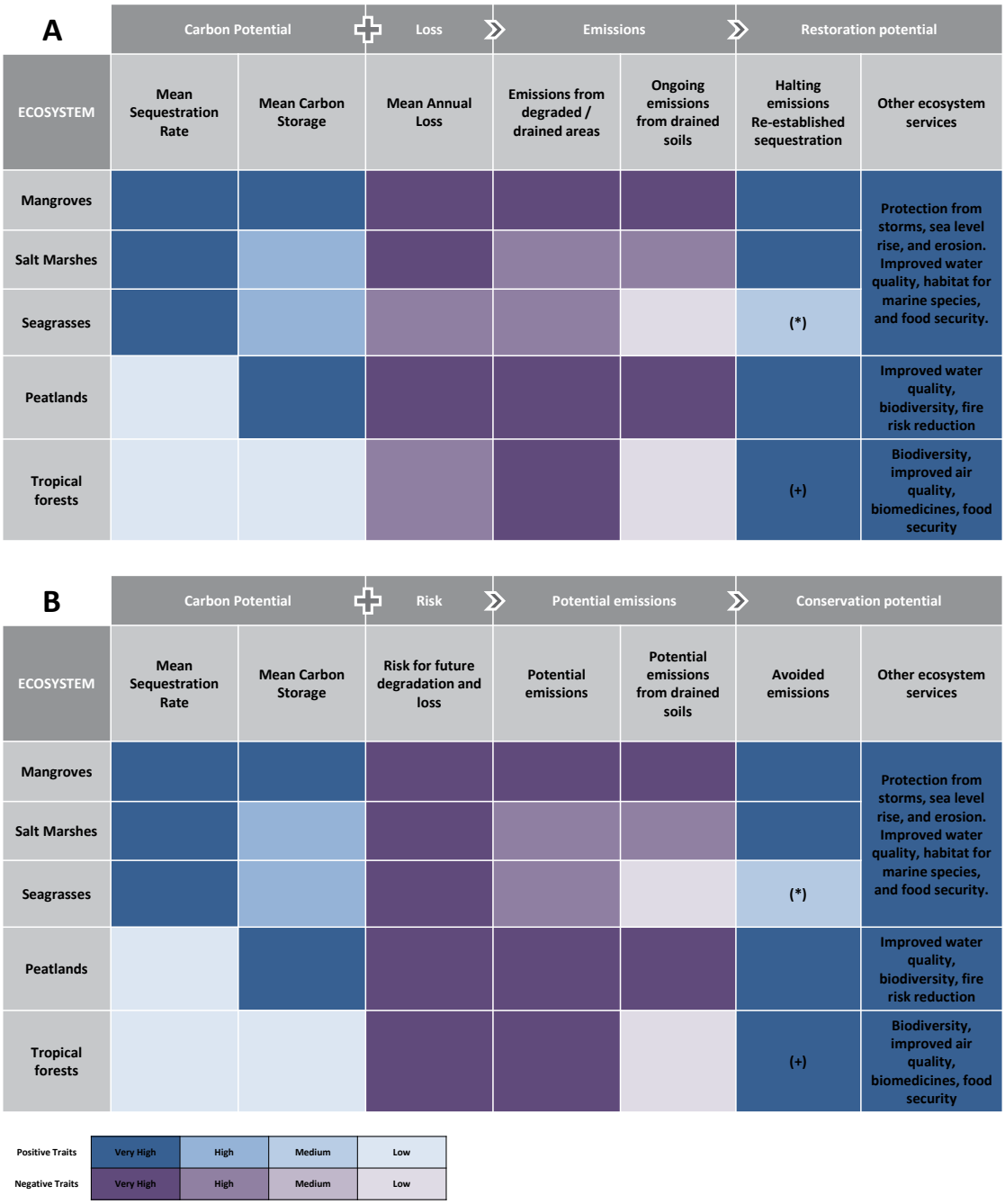
Ecosystem management practices that, compared to a baseline (starting point for comparison or business as usual (BAU) scenario), show a reduction of GHGs emissions by sources, or increased sequestration of carbon by sinks, are considered carbon mitigation activities. However, in its broadest understanding, mitigation activities – as well as climate change adaptation and conservation activities – can also include national capacity building or awareness raising efforts (e.g. enabling stakeholders to use mangroves in a sustainable manner), support for institutional set-up, developing and implementing sectoral policies, enforcing changes in national legislation, and engaging stakeholders. The goals for mitigation are most prominently aligned with climate adaptation objectives, especially for nature-based solutions such as in agriculture, forestry, and the rural land use sectors.[1] The 5th Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) stated that land use policies, including REDD+, are more effective when both mitigation and adaptation are addressed.

2.2 Linking mitigation finance with other sources of conservation funds

Activities designed to carry out nature-based solutions for climate change mitigation and adaptation and incorporate conservation of biodiversity[2] are more attractive to donors than single purpose projects. The Climate

REDD+ stands for “Reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries”

Figure 2. Comparing systems based on characteristics that make them attractive and unique for carbon mitigation and climate finance. A) Restoration potential B) Conservation potential



Note (1): This is a qualitative assessment, for quick illustration purposes only. For detailed, quantitative comparison, see for example Fourqurean et al. 2012; Pan et al. 2011; Pendleton et al. 2012, McLeod et al. 2011, Joosten, H. 2010.

Note (2): Degraded wetlands, especially peatlands, have ongoing emissions from soil. These emissions will continue even if conversion and/or deforestation are reduced unless proper restoration efforts are being undertaken.

(*) due to challenges with restoration practices
(+) due to their global extent

Finance Option website operated by the World Bank and United Nations Development Program (UNDP) reflect this by allowing project and program managers to search for funding sources that are available for both adaptation and mitigation projects. Several adaptation-oriented funds will be presented in this paper (see chapters 3.2), including the Special Climate Change Fund (SCCF), the Least Developed Countries Fund (LDCF) as well the Adaptation Fund (AF). Adaptation projects, with explicit mitigation benefits, could also profit from carbon funding to overcome potential financial barriers to adaptation.[3] Biodiversity finance has been the most traditional route to fund activities around the conservation and restoration of coastal wetland areas. Using or combining climate change finance with existing or planned biodiversity finance can also help to reduce the upfront investment needed if climate finance would be used alone. In other terms, countries that have high marginal (extra) costs of setting up new projects or programs can use biodiversity finance to encourage climate finance by reducing the incremental (additional) cost of mitigation and adaptation activities.[4] For example, REDD+ financing can be supplemented creating a premium price for emissions reductions originating in high-biodiversity forests[5] and transaction and start-up costs could be lower for biodiversity payments using the infrastructure set in place for the implementation of REDD+ (e.g. monitoring, accounting and governance). A schematic overview of these different funding means is shown in Fig. 3 below.

The information available in this revised report will focus on other innovative finance means, such as debt relief and conversion initiatives, debt-for-nature swaps, insurance mechanisms, and Payment for Ecosystem Service (PES) mechanisms. Sections on the climate finance mechanisms as well as in relation to other international conventions will reflect the most current numbers.

Further reading

Pendleton, L. et al. (2012) Estimating Global "Blue Carbon" Emissions from Conversion and Degradation of Vegetated Coastal Ecosystems. PLOS ONE. DOI: 10.1371/journal.pone.0043542

McLeod, E. et al. (2011) A blueprint for blue carbon: toward an improved understanding of the role of vegetated coastal habitats in sequestering CO2. Frontiers in Ecology and the Environment 9: 552–560. doi: 10.1890/110004

Duarte, C. M. et al. (2013) The role of coastal plant communities for climate change mitigation and adaptation. Nature Climate Change 3, 961–968 (2013) doi:10.1038/nclimate1970

Thomas, S. (2014) Blue carbon: Knowledge gaps, critical issues, and novel approaches. Ecological Economics 107, 22–38. http://dx.doi.org/10.1016/j.ecolecon.2014.07.028

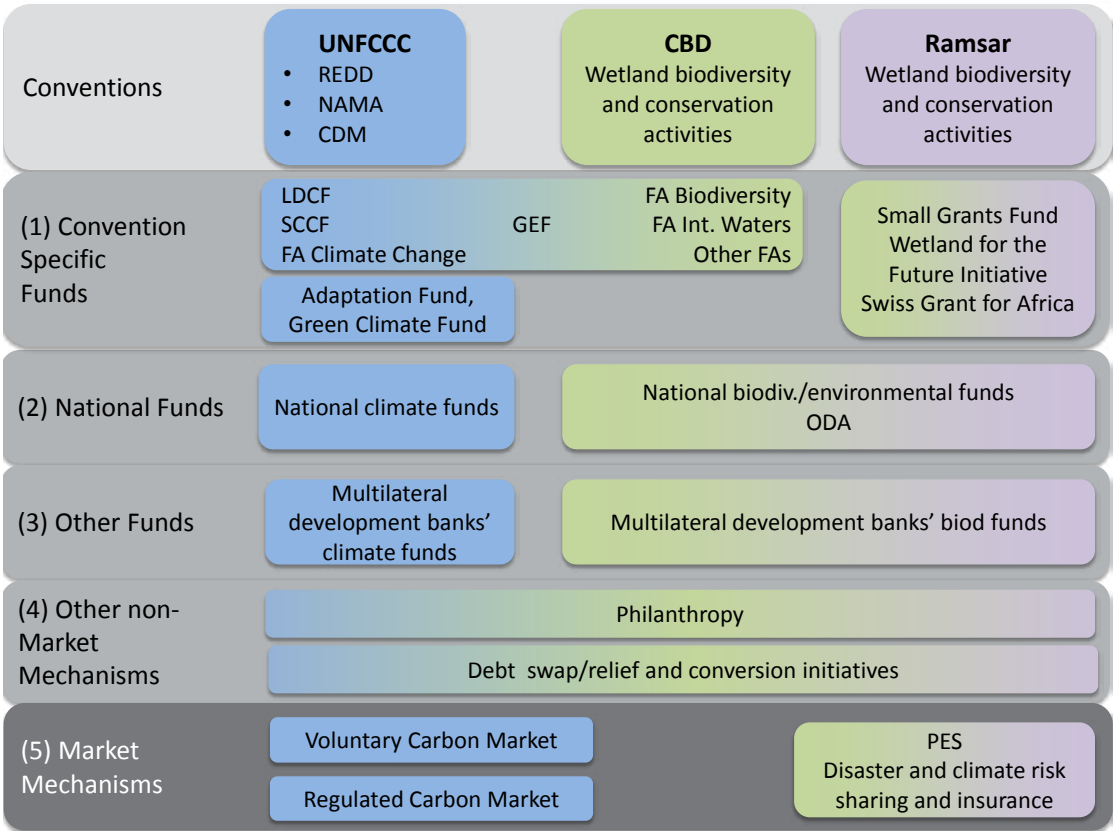
Miteva, D. A. (2015) Do protected areas reduce blue carbon emissions? A quasi-experimental evaluation of mangroves in Indonesia Ecological Economics 119, 127–135

Emmett-Mattox, S. and Crooks, S. (2013) Coastal Blue Carbon as an Incentive for Coastal Conservation, Restoration and Management: A Template for Understanding Options. Restore America's Estuaries.

Ehler, C. and Douvere, F. (2009) Marine Spatial Planning: a step-by-step approach toward ecosystem-based management. Intergovernmental Oceanographic Commission and Man and the Biosphere Programme. IOC Manual and Guides No. 53, ICAM Dossier No. 6. Paris: UNESCO.

WWF and Credit Suisse Group AG and/or its affiliates, and McKinsey & Company (2014) Conservation Finance Moving beyond donor funding toward an investor-driven approach

Figure 3. Overview of the main climate (blue) and biodiversity-related (green and purple) finance mechanisms relevant for coastal (wetland) carbon projects and programs



3 UNFCCC related finance mechanisms and applications

inasmuch as they have been updated.

3.1 Projects and programs: In a nutshell

The United Nations Framework Convention on Climate Change (UNFCCC) sets the general structure for internationally agreed GHG reduction measures, and provides technical details and dedicated funds to support a variety of climate mitigation activities, including wetland carbon activities. Within the context of the UNFCCC, coastal as well as other wetland carbon activities can be initiated as independent projects or as components of larger national or sub-national programs to combat climate change. This distinction between mitigation projects and programs will be a factor in determining which financial mechanisms can be used to fund certain activities.

While other related arenas, e.g. the voluntary carbon market, are quicker in developing and implementing specific efforts (e.g. carbon offset project requirements and methodologies), (see chapter 6), the UNFCCC ultimately provides the more important signals for how wetlands carbon projects and programs can be financed, implemented and integrated on a global scale under the treaty. This is also the case for adaptation driven activities, although in this case other international regimes, such as the Convention for Biological Diversity (CBD) or the Ramsar Convention also provide guidance and (limited) financial means.

Although to some extent an artificial construct, the distinction this report makes between projects and national or sub-national programs should guide the reader to find those funds or financial mechanisms that suit best the type of activities he/she intends to get involved in. Due to inevitable overlap between projects and programs multiple funding options could be explored.

Issue of double counting

Whereas other, more technical literature provides further detail on this subject[6], a brief side note about the risk of double counting will be made at this stage. Some nations account for emissions and removals from wetlands as part of their national GHG inventories to the UNFCCC whilst others don't. If both carbon offset projects, and a national wetlands accounting scheme exits (or where a national scheme is being developed) potential double-counting of the GHG effects arises. A potential conflict between project or country level measurement needs to be addressed to avoid GHG changes being accounted for twice. This conflict can be avoided by tracking GHG changes at relevant scales and incorporating the GHG consequences of ongoing efforts into the calculus of planned initiatives.

3.1.1 National or sub-national programs

National or sub-national programs refer to large-scale efforts resulting in better management of wetland areas across all or part of the country. The UNFCCC provides guidance for countries to develop national or sub-national mitigation and adaptation programs in the context of land-use management, including forestry, peatlands and coastal wetlands. For climate mitigation, specific mechanisms have been put forward such as Nationally Appropriate Mitigation Activities (NAMAs) and Reducing Emissions from Deforestation and forest Degradation

(REDD+) with corresponding financing mechanisms. Mangroves can be addressed under REDD+ as long as they fall under the respective national definition of forests. All three coastal carbon ecosystems can be incorporated into NAMAs. In parallel, adaptation mechanisms like National Adaptation Programs of Action (NAPAs) and National Adaptation Plans (NAPs) with corresponding financing avenues also exist.

For further details regarding national or sub-national carbon programs, please see the 2014 edition of this report.

3.1.2 Projects

Wetland carbon projects refer to distinct geographically confined activities that result in measurable and verifiable GHG reductions (i.e., mangrove planting). Other wetland carbon activities including capacity building, technical guidance and policy analysis reports can be seen as projects, undertaken foremost by NGOs, to support overall development and implementation of direct wetland carbon interventions. The Clean Development Mechanism (CDM) was designed specifically for project level activities. Alternatively, projects that align with larger sub-national and national programs are eligible to be included in the programs listed in chapter 3.2.


© T. Agardy

For further details regarding carbon projects, please see the 2014 edition of this report.

3.2 About UNFCCC specific financial mechanisms

Coastal wetland carbon mitigation and adaptation activities can be financed via several climate-related funds under the UNFCCC. The Global Environment Facility (GEF) is one financial mechanism[7] which is divided into the GEF Trust Fund and its Focal Areas (FA), the Special Climate Change Fund (SCCF) and the Least Developed Countries Fund (LDCF). The GEF is supported by 183 countries in partnership with international institutions, NGOs, and the private sector and is governed by the GEF Council representing 32 constituencies (16 from developing countries, 14 from developed countries, and two from countries with transitional economies). In addition to the GEF the UNFCCC set up additional funds such as the Green Climate Fund and the Adaptation Fund, and wetland carbon activities can fit under both. Other relevant international climate funds, such as the BioCarbon Fund are briefly explained below.

3.2.1 GEF Trust Fund

The GEF's central fund is the Global Environment Facility Trust Fund (GEF TF). It finances activities in seven main Focal Areas (FA), including biodiversity, climate change (mitigation and adaptation), chemicals, international waters, land degradation, sustainable forest management/ REDD+, and Ozone layer depletion (see Fig 4). Every four years the GEF undergoes a strategic review that set the priorities of the FAs and replenishes the fund with new donor money. Currently efforts are being financed as part of the GEF 6th cycle (GEF-6: 2014 – 2018).

The GEF-6 Climate Change Mitigation Strategy, as part of the FA Climate Change, is interested in initiatives that are synergistic and clearly show added value by addressing multiple environmental benefits within a single unique project. Examples of eligible topics include sustainable forest

management (SFM) and land use-related carbon management. During GEF-6, climate mitigation projects at the national level requesting GEF support should be designed as means to address barriers, mitigate risks, and facilitate the implementation of priorities identified in National Communications and Biennial Update Reports (BURs), or in line with a NAMA.[8] The GEF Operational Focal Point's Guide explains the GEF Project Cycle in all detail.

3.2.2 Special Climate Change Fund (SCCF)

The SCCF, operated via the GEF, exists to finance programs relating to capacity-building, adaptation, technology transfer, and climate change mitigation and economic diversification for countries highly dependent on income from fossil fuels.[9] Within these categories, the SCCF has two active funding windows: the Adaptation window (SCCF-A) and Technology Transfer window (SCCF-B). For further information see the 2014 edition of this report, or visit the SCCF website.

To date, some $349.08 million (as at August 31, 2015) have been pledged, of which $344.08 million or 99% had been paid.[10] The largest share of SCCF financing is directed towards agriculture (25%) and enhancing the resilience of water resources management with 22% of approved resources. Coastal zone management and disaster risk management are other priority sectors for SCCF financing, with 10% and 12% of the resources approved respectively.[11]

3.2.3 Least Developed Countries Fund (LDCF)

The objective of the LDCF is to address the unique needs of the 48 Least Developed Countries (LDCs), which are especially vulnerable to the adverse impacts of climate change. The fund has reached $935.69 million (August 31, 2015), and activities supported under this GEF operated fund include preparing and implementing NAPAs to identify the immediate needs of LDCs to adapt to climate change. LDCF grants are awarded to adaptation projects that address high-priority areas identified in the approved, country-specific NAPA. To date funding has been gone to agriculture and livestock projects (31% of total funding approvals), natural resources management (18%), coastal zone management (12%) and water resources management (12%).[12]

The LDCF is governed by the GEF and therefore is implemented only after the approval of the GEF Council and subsequent endorsement by the GEF CEO. LDCF funds are disbursed in the form of grants, which are considered Official Development Assistance (ODA). Applicants seeking LDCF funding must show co-financing plans and a cost-effectiveness study for their proposed activity.

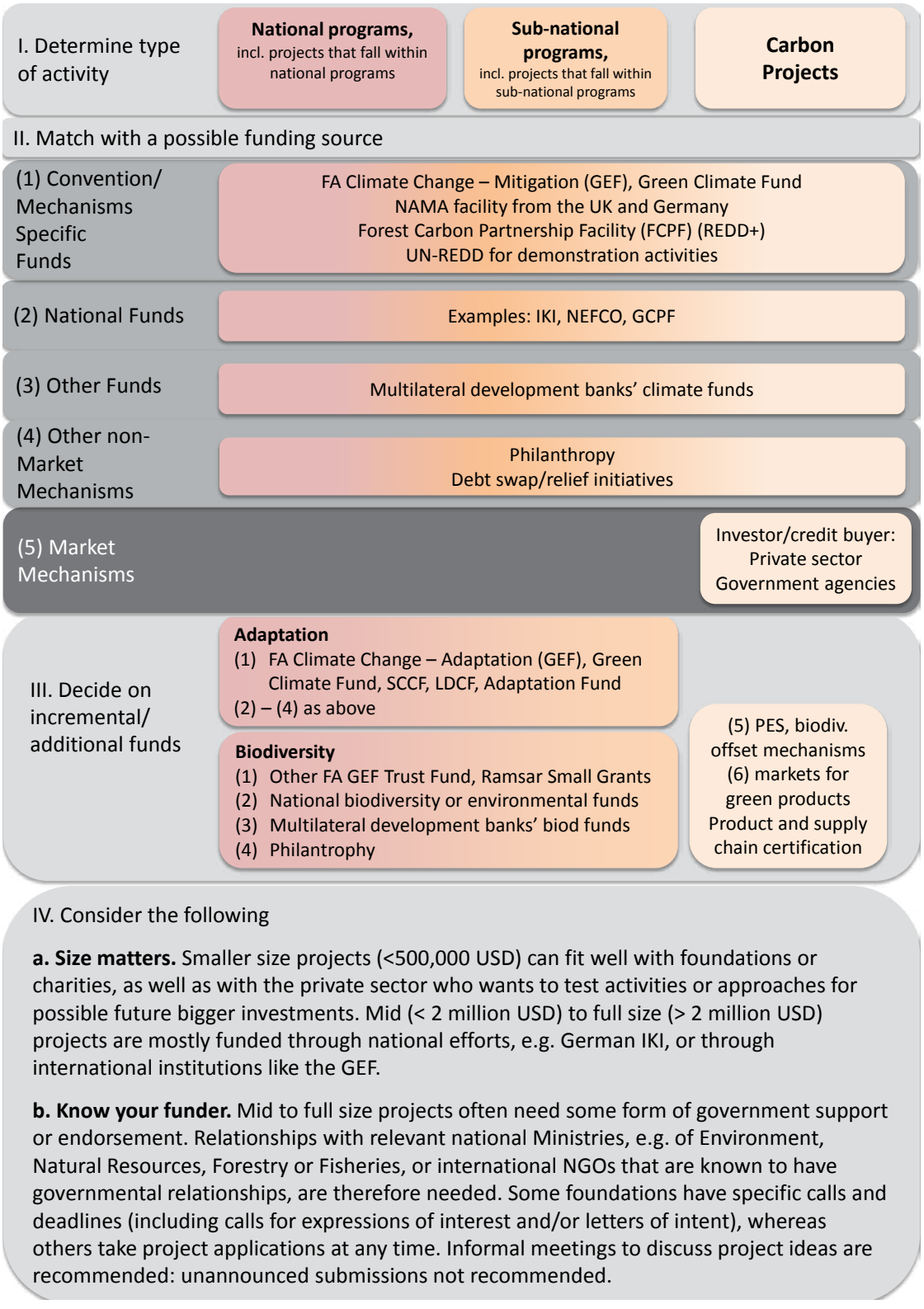
The latest progress report of the LDCF/SCCF Council Meeting however states: "In the near term, the demand for LDCF resources considerably exceeds the funds available for new approvals. As of September 22, 2015, funds available for new funding approvals amounted to $17.78 million; whereas 34 full-sized projects (FSP) and one medium sized project (MSP) had been technically cleared for a total funding demand of $254.48 million. In addition, another 13 project proposals, requesting a total of $72.02 million, had been endorsed by countries' operational focal points and formally submitted for review by the Secretariat."

3.2.4 The Green Climate Fund (GCF)

In 2010 The Green Climate Fund (GCF) was established as a finance mechanism under the UNFCCC and is governed by the GCF Board. The GCF is a mechanism to transfer money from the industrialized to the developing world, in order to assist the developing countries in adaptation and mitigation practices to counter climate change. The GCF will support projects, programs, policies and other activities in developing country Parties and will aim for a 50:50 balance between mitigation and adaptation over time. Under the GCF's portfolio a total of 37 initial funding proposals for projects and programs from public and private sector have been submitted, eight of which have been sent

Figure 4. Overcoming the climate finance jungle - How and where do I start?

This summary briefly sets out the main elements that need to be considered when starting to look for wetland carbon finance (examples only). For details, please see following chapters.



to the GCF Board for its consideration. The GCF has recently (Nov 2015) approved these first 8 investments, including on wetlands and ecosystem resilience.

Access to GCF resources will be through national, regional, and international implementing entities nominated by the recipient countries and accredited by the GCF Board. The GCF will provide financing mainly in the form of grants and concessional lending, with the remaining financing in the form of other modalities, instruments or facilities. Priority will be given to results-based approaches, in particular for incentivizing mitigation actions, and payments for verified results, where appropriate.

The GCF is applicable to all sectors covered by the UNFCCC and Kyoto Protocol and will support *project-based* as well as *programmatic approaches* as long as they are in line with the country's climate change strategies and plans. These can be low-emission development strategies or plans, nationally appropriate mitigation actions (NAMAs), national adaptation plans of action (NAPAs), national adaptation plans (NAPs) and other related activities.

The Fund will also have a private sector arm that enables it to finance mitigation and adaptation activities at the national, regional and international levels. In addition, the facility will promote the participation of private sector actors in developing countries, in particular local actors, including small- and medium-sized enterprises and local financial intermediaries.[13]

3.2.5 The Adaptation Fund

The Adaptation (AF) became operational in 2008 and administers grants to national, regional, or multilateral implementing entities. The aim is to finance practical adaptation projects and programs in developing countries and support capacity-building activities. Financing is derived from an adaptation levy (2%) on CDM projects[14] under the Kyoto Protocol and gets administered by the Adaptation Fund Board. AF financing post-2020 depends on the continuation of the CDM and the level of demand in the carbon market. Assuming that the adaptation levy of 2% on CDM projects applies post 2012, the level of funding could be $100−500 million (USD) for a low demand for credits from non-Annex I Parties to $1−5 billion (USD) in 2030 for high demand.

In order to qualify for funding from the AF the general eligibility criteria for countries are:

(1) Party to the Kyoto Protocol

(2) Particularly vulnerable to the adverse effects of climate change. This includes: low-lying coastal and other small island countries, and countries with fragile mountainous ecosystems, arid and semi-arid areas, and areas susceptible to floods, drought and desertification.

Supported activities relevant for wetlands include:

(1) Water resources management, land management, agriculture, health, infrastructure development, fragile ecosystems;

(2) Supporting capacity building, including institutional capacity, for preventive measures, planning, preparedness and management of disasters relating to climate change;

(3) Strengthening existing and, where needed, establishing national and regional centers and information networks for rapid response to extreme weather events, utilizing information technology as much as possible.

The Adaptation Fund has committed US$330 million in 57 countries since 2010 to climate adaptation and resilience activities (October 2015). To date, 48 projects have been approved, representing US$318 million of which 34 projects currently under implementation, representing US$212.9 million.[15] There are currently 10 projects (September 2015) listed under the coastal zone management portfolio.

3.3 About other multilateral and national climate funds

There are additional initiatives and funds (including bilateral and multi-lateral initiatives) such as the climate change funds (CCFs) from the African and Asian Development Banks that work towards the objectives of the UNFCCC, and countries' obligations under the Convention. These funds aim at ensuring that - in the case of the African CCF - countries on the African continent have access to funds for 'climate finance readiness' projects, this allows governments to apply for larger amounts of money from the Green Climate Fund. In the case of the Asian CCF[16] resources get pooled within the Asian Development Bank to address climate change through technical assistance and grant components of investment projects.

3.3.1 BioCarbon Fund

BioCarbon Fund, as part of the Carbon Finance Unit of the World Bank, is a public-private sector initiative mobilizing financing to help develop projects that sequester or conserve carbon in forest and agro-ecosystems.

The BioCFplus program (about $6 million) supports project development and implementation with capacity building and training. The program further supports the pioneering role of the BioCarbon Fund by developing methodologies and tools for carbon accounting, promoting policy dialogue and by disseminating lessons learned.

The BioCarbon Fund Initiative for Sustainable Forest Landscapes (ISFL) (http://www.biocarbonfund-isfl.org) seeks to promote reduced greenhouse gas emissions from the land sector, from deforestation and forest degradation in developing countries (REDD+) and from sustainable agriculture, as well as smarter land-use planning, policies and practices. In the case of coastal wetlands, this fund could be used for activities involving mangroves, if the country includes mangroves in their definition of forest.

3.4 Application of UNFCCC specific financial mechanisms to projects and programs

Any wetland carbon efforts working towards achieving the objectives of the UNFCCC are linked to either NAMAs, REDD, NAPAs and NAP, or implemented as a CDM project activity. The following chapter briefly summarizes the sources of finance for each.

A trend currently observed, especially for coastal wetlands, is so-called scoping or national assessment studies, to assess the climate change mitigation and adaptation potential of a country or region via better coastal management and policy change. Such studies are foremost supported by foundations or linked to university projects. Some countries or regional provinces, such as Abu Dhabi, are also directly investing into such scoping assessments.

3.4.1 Financing NAMAs

Financial support for the implementation of national programs under NAMAs is available from various international and national funds.

UNFCCC funds: GEF Trust Fund, FA Climate Change, possibly linked to other FA (see 7.2.1) and the Green Climate Fund

National funds: e.g. ICI (Germany), Global Frame and GCPF (Denmark), the GEEREF, the AFD and FFEM (France), and NEFCO (from the Nordic countries).

Other funds: Multilateral institutions, e.g. ADB, IDB, WB Group

NAMA specific: NAMA facility in the UK and Germany

3.4.2 Financing REDD+

Even though the REDD+ financing mechanism hasn't been agreed upon yet, financing windows have already emerged to assist countries to get ready for the engagement in a possible future REDD+ mechanism under the FCCC. The main funding streams are those of the Forest Carbon Partnership

Case Study 1: Blue Carbon NAMA, Dominican Republic

The Dominican Republic registered the first Blue Carbon NAMA under the UNFCCC's Nationally Appropriate Mitigations Action (NAMA) mechanism. The first of its kind, the submission, is effectively a declaration of intent by the government to mitigate GHG emissions in a manner commensurate with capacity and in line with national development goals. The experience and lessons learned in the Dominican Republic can serve as pilot and facilitate the development of blue carbon programs globally.

Based on the findings from a blue carbon study on one of the country's largest mangrove sites, government officials invited Counterpart International to advise on the development of a Blue Carbon NAMA concept that both (1) integrates mangrove conservation, restoration, and sustainable use practices into existing international policy and financing processes and (2) serves as a transformational tool in effective national natural carbon management.

The blue carbon NAMA concept is based on a capacity building approach in support of public and private sector institutions to implement a number of key activities. These include quantifying the carbon sink capacity, developing an inventory of carbon credits, facilitating a national dialogue, preserving or replanting mangroves, developing strategies to support economic development, managing finance mechanisms for key communities, and developing a tool kit that can be used by other countries in designing and implementing blue carbon NAMAs.

The initial work on the NAMA (concept and registration), undertaken by Counterpart International with the Presidents Climate Council was funded with support from private foundations. Currently funding through bilateral and multilaterals for the design and implementation is being sought.

Facility (FCPF) of the World Bank and UN-REDD (for more detail see further below). In the context of REDD+, "readiness" can be applied to jurisdictional and/or sub-national programs and pilot project activities with the objective to explore and test the entire collective aspects associated with REDD+.

National funds: In addition, REDD+ readiness programs are being financed with bilateral funding from countries such as Norway, as well as through other national climate change funds, e.g. German ICI.

Other non-market: Philanthropy – Significant sums of money for stand-alone projects (with the aim to feed into national REDD+ programs) are also currently available to REDD+ and other wetland carbon activities through philanthropic organizations (e.g., Bill Gates Foundation or the Prince's Rainforest Project (Prince Charles, UK).

Private sector: Activities are also funded via the private sector, either directly or through a private fund (e.g., the Danone Livelihoods Fund or the Althelia Fund), or through investment groups (e.g. Permian Global).

Forest Carbon Partnership Facility

The Forest Carbon Partnership Facility (FCPF) is a global partnership of governments, businesses, civil society, and Indigenous Peoples focused on REDD+ in developing countries.

The FCPF has two separate but complementary funding mechanisms — the Readiness Fund and the Carbon Fund. Both funds are pledged by a multi-donor fund of governments and non-governmental entities that make a minimum financial contribution of US$ 5 million. The total contribution to date is US$825 million: US$360 million for the Readiness Fund and US$465 million for the Carbon Fund.

There are currently 47 participating countries: 18 in Africa, 18 in Latin America, and 11 in the Asia-Pacific region.

Most support for countries is used for the development or improvement of institutional and legal frameworks, including the development of systems for MRV and monitoring, but some pilot project may be financed too. Coastal wetland activities could qualify as pilot projects, but only if the activity is an identified REDD+ priority (i.e. addressing some of the prime drivers or underlying causes of deforestation and/or forest degradation) is it likely to be selected for support.

UN-REDD

The UN-REDD Program is the United Nations' collaborative initiative on REDD in developing countries; a collaboration between the UNDP, Food and Agriculture Organisation (FAO), and United Nations Environment Program (UNEP). The UN-REDD Program supports nationally-led REDD+ processes and promotes the "informed and meaningful involvement of all stakeholders, including Indigenous Peoples and other forest-dependent communities, in national and international REDD+ implementation".

The program supports national REDD+ readiness efforts in 64 partner countries, spanning Africa, Asia-Pacific and Latin America and the Caribbean, in two ways: (i) direct support to the design and implementation of UN-REDD National Programs; and (ii) complementary support to national REDD+ action through common approaches, analyses, methodologies, tools, data and best practices developed through the UN-REDD Global Program.

UN-REDD however, does not finance project activities: it finances demonstration activities but these are not to be viewed as REDD+ pilot projects – the incentives/payments system for these activities will not be based on performance in terms of emission reductions/ removals.

Donors' contributions sum up to US$255 million, which the majority is already allocated.[17]

3.4.3 Financing NAPAs

Financial support for the implementation of national programs under NAPAs is available from various international and national funds.

UNFCCC Funds: LDCF

National funds: e.g. ICI (Germany), Global Frame and GCPF (Denmark), the GEEREF, the AFD and FFEM (France), and NEFCO (from the Nordic countries).

Other funds: Multilateral institutions, e.g. ADB, IDB, WB Group

3.4.4 Financing NAPs

UNFCCC funds: Financing of NAP preparation is currently not linked directly to a funding source, but can be facilitated through the SCCF. However, developing country Parties are encouraged to make use of existing support channels and mechanisms, including those available through multilateral and bilateral agencies. The GEF has created a "NAP support program" but that consists of a series of regional workshops and other technical assistance activities for LDCs launching NAPs.

3.4.5 Financing CDM projects

Private sector: In terms of funding, the UNFCCC agreed that financial support for the CDM would not be a diversion of conventional ODA; the finance had to be new and additional. This means that many public finance streams are blocked of and the CDM has become mainly a private sector driven instrument. The BioCarbon Fund has also a strong track record of being involved in CDM related efforts, for example, it is responsible for the first issuance of carbon credits for a forestry project under the CDM, globally and also in Africa.[20]

Case Study 2: L'Oceanium De Dakar, Senegal

The Senegalese NGO Océanium along with The Livelihoods Fund, IUCN, and Danone started a revegetation project in 2008 to restore the shrinking mangrove forests with the goal of increasing coastal resilience to climate change, enhancing local agriculture, and restoring fish stocks. Since its inception, 79 million mangrove trees over 7920 hectares have already been planted, making it the world's largest mangrove reforestation project. The new trees are estimated to be worth over half a million carbon credits. The Livelihoods Fund, comprised of investors from 10 European companies (Danone, Schneider Electric, Crédit Agricole, Michelin, Hermès, SAP, CDC Climat, La Poste, Firmenich, Voyageurs du Monde) directly funded the development of the large scale CDM mangrove reforestation methodology and further invested in the CDM project itself.

This project was validated by the UNFCCC Board. The PPD (Project Detailed Document) made by Carbon Decisions in December 2010 was audited by Ernst & Young as the DOE in May 2011. The approval of the Senegalese authorities (LoA) was obtained in March 2011. This approval is subject to a tripartite Memorandum of Understanding of 10 years between Livelihoods, Océanium, and the Senegalese government.

Further reading

NAMA - van Tilburg, X. et al. (2013) Status Report on Nationally Appropriate Mitigation Actions (NAMAs) Mid-year update June 2013. ECN and Ecofys.

NAMA registry: http://www4.unfccc.int/sites/nama/SitePages/Home.aspx

REDD+

REDD Desk - The REDD Desk is the largest collaborative resource for REDD+ information, news and analysis on the web. http://theredddesk.org/what-is-redd

Angelsen, A., Brockhaus, M., Sunderlin, W.D. and Verchot, L.V. (eds) (2012) Analysing REDD+: Challenges and choices. CIFOR, Bogor, Indonesia.

Streck and Costenbader 2012 Standards for Results-Based REDD+ Finance: Overview and Design Parameters. Available at Standards for Results-Based REDD+ Finance: Overview and Design Parameters, last accessed 11/9/2015.

Gordon, D., B.C. Murray, L. Pendleton, and B. Victor. 2011. Financing Options for Blue Carbon: Opportunities and Lessons from the REDD+ Experience.

NAPAs

Status of NAPA implementation under the LDCF

Mavrogenis, S. and Kelman, I. (2014) Theory, Policy and Practice for Climate Change Adaptation. In: Environmental Change. Adaptation Challenges, Edition: 1st, Chapter: Theory, Policy and Practice for Climate Change Adaptation, Publisher: Global Change Research Centre, the Academy of Sciences of the Czech Republic, Editors: Barbora Duží, pp.12-20, Forthcoming .

NAPs

WRI (2014) Clarifying the UNFCCC National Adaptation Plan Process. Blog.[9]

UNFCCC (2012) National adaptation plans: Technical guidelines for the national adaptation plan process", LDC Expert Group, December 2012. Bonn, Germany.

List 1. Relevant online sites with overviews and updates in available climate funding

The Finance Portal

The Finance Portal, designed by the UNFCCC Secretariat will comprise three modules:

1. the **'National Communications Module'** (here a compilation is made of information extracted from NC4 and 5 of industrialised countries reports on their contributions to less developed nations);
2. the **'Fast-start Finance Module'** (approximately USD30 billion over the period 2010 – 2012, including forestry); and,
3. the module related to the **'Funds Managed by the GEF'** (a joint effort between the UNFCCC and GEF secretariats).

Pilot versions of 1) and 2) can already be found on the UNFCCC website. Additionally the Finance Portal provides information on projects and programs of the **Adaptation Fund**.

An interactive flowchart is provided that leads to approximately 50 website pages with detailed information on expenditure to date.

Climate Funds Update

is an independent website that provides information on the growing number of international climate finance initiatives designed to help developing countries address the challenges of climate change.

Climate Finance Options

Shows funds that are available for both adaptation and mitigation projects that reduce impacts of climate change. See whether your project is eligible, what the governance structure for these funds is, and how to access them.

Terra Viva Grants

The Terra Viva Grants Directory develops and manages information about grants for agriculture, energy, environment, and natural resources in the world's developing countries.

Adaptation Marketplace

The Coral Triangle Adaptation Marketplace was developed to assist adaptation project developers find appropriate funding opportunities. It uses a "matchmaking" framework to link available funding to coastal and marine climate adaptation projects in an efficient and accessible format. Its function is to connect investors with project implementers according to available funding in an interactive and supported forum, thus increasing the numbers of adaptation initiatives implemented in the Coral Triangle region.

4 Coastal wetland carbon projects funded via the voluntary carbon market

The slow pace at which the intergovernmental process of the UNFCCC was moving prompted a high level of frustration within the private sector. The issue of Corporate Social Responsibility (CSR) combined with the protection of *licenses to operate* (ensuring support for continued industry engagement despite social, community and environmental issues) in developing countries led to a high willingness of the private sector to start investing in restoration and conservation efforts. At the same time the conservation community wanted to capitalize on the new "invest in nature" momentum that was building up. These shared interests can be realized through participation in voluntary carbon markets.

4.1 Voluntary carbon markets

Unlike the CDM where verified CERs are sold through a UN controlled market, voluntary carbon markets[18,19] deal with the selling and buying of emission reduction credits (offsets) in markets that are not government regulated.

In the case of voluntary markets the demand for verified carbon credits is driven by voluntary customer demand. Buyers of carbon offsets may be the general public driven to reduce their carbon footprint from activities such as air travel. Companies and other emitting entities are participating in the voluntary market mainly to take action to reduce emissions above and beyond their legal obligation to comply with their own CSR or Good Stewardship, to brand themselves as green, or to hedge against future compliance obligations.

While good carbon projects tend to be expensive, some coastal wetland carbon projects can be economically feasible at moderate to low carbon prices. Studies in the literature have estimated that coastal carbon offset projects can be economically feasible at low to moderate prices of $2-11 per ton CO_2e, not accounting for transaction costs.[20] Also, the majority of potential emissions from mangroves could be avoided at less than $10 per ton CO_2e.[21] For comparison, at the time of writing, the average carbon price across markets in 2013 was $4.90 per ton CO_2e.[22]

The overall costs for a coastal wetland carbon project however vary greatly across countries and regions due to location specific price levels, cost of labor and capital. To fully evaluate the economic potential of a wetland carbon project, the full costs of avoiding habitat conversion or undertaking restoration activities need to be considered, including so called opportunity costs – foregone net revenues from using the coastal wetland for an alternative (commercial) purpose, e.g. hotel development or aquaculture.[23]

A number of carbon market facilities already include freshwater wetlands (peatland) projects, often in connection with forestry projects.[24] They could potentially include coastal wetland project activities and efforts are currently underway to develop methodologies for verifying coastal wetland carbon credits. Leading organizations like the Verified Carbon Standard (VCS) or the American Climate Registry (ACR) are used globally to verify and issue carbon credits from field projects to be traded on the voluntary carbon markets. Other standards generating CO_2-certificates for the voluntary market include:

- The Climate, Community, and Biodiversity Standard (CCB) – uses VCS or CDM methodologies for the carbon component of their projects;
- The CarbonFix Standard – now absorbed by the Gold Standard – only deals with afforestation and reforestation at this stage and plans to scale up to include "Improved Forest Management" (IFM) projects too; or
- The Plan Vivo Systems and Standard – mainly concentrating on capacity building but is lacking a robust carbon quantification procedure.

The remaining chapter will provide an overview of the leading standards and methodologies for coastal carbon projects as well as of financial sources for developing projects. It will end with a brief excursion on the different types of contracts available for carbon offset projects.

4.2 Leading carbon standards and methodologies

Few carbon standards have so far issued specific requirements and guidance for wetlands restoration and conservation activities, with only a selected few having specific coastal wetlands methodologies, at the time of writing.

Carbon developers interested to set up a wetland carbon project need to find an appropriate standard, as well as applicable methodologies to measure, report, and verify changes in carbon sequestration and stock. This can facilitate the certification of net emission reductions taking place in a given project. If no methodology applies, a new one needs to be developed, increasing the funding need to start a project.

The VCS, for example, has generated 16 methodologies including on peatland conservation and restoration, and has close to 80 projects in the fields of agriculture, land use and forests (AFOLU).

For coastal wetlands of relevance is the *Methodology for Coastal Wetland Creation, v1.0* also contains an adaptation goal. Through carbon finance, this methodology facilitates the restoration of wetlands to protect the coastline and ultimately people's homes. A *Methodology for Tidal Wetland and Seagrass Restoration* is under development.

Case Study 3: Financing through voluntary markets, Madagascar

Since 2011, Blue Ventures has been involved in BC projects in Madagascar, to assess the feasibility of using BC as a long-term financial mechanism for community-based mangrove management at two demonstration sites, 1) Ambaro-Ambanja Bay–a large scale (26,000 ha of mangroves) VCS project, and 2) Bay of Assassins–a smaller (1,015 ha of mangroves) Plan Vivo project. The specific goals are to develop technical and organizational capacities of local communities to sustainably manage their mangroves. Management plans were developed over an area of 10,492 ha of mangroves across sites and the management rights of over 23,000 coastal people secured through the establishment of a Marine Protected Area (MPA) and five management transfers. Over 45 ha of mangroves were also restored through community volunteer reforestation programs. Second, the project held research and stakeholder consultations to develop "blue" carbon projects. As part of the initiative, above and below ground carbon stock estimates were published.

Further reading

Ecosystem Marketplace (2012) Leveraging the Landscape State of the Forest Carbon Markets 2012

Ecosystem Marketplace (2014) Turning over a new leaf: State of the forest carbon markets 2014

Murray ,B.C., et al. (2011) Green payments for blue carbon: Economic incentives for protecting threatened coastal habitats. Report NI R 11-04, Nicholas Institute for Environmental Policy Solutions, Duke University, Durham.

Siikamäki, J., Sanchirico, J. N., & Jardine, S. L. (2012). Global economic potential for reducing carbon dioxide emissions from mangrove loss. Proceedings of the National Academy of Sciences, 109(36), 14369-14374. http://dx.doi.org/10.1073/pnas.1200519109

Although no coastal wetlands project is currently registered in the VCS yet, the technical framework is in place to do so.

Similarly, the American Climate Registry (ACR) issued a methodology on Restoration of Degraded Deltaic Wetlands of the Mississippi Delta that details requirements for GHG emission reduction accounting from wetland restoration activities implemented on degraded wetlands of the Mississippi Delta. The methodology quantifies increased carbon sequestration in aboveground biomass, belowground biomass, and soil organic carbon over and above the baseline scenario. Increases in CO_2, methane or nitrous oxide, if significant and attributable to the project activity, must also be quantified and deducted from net emission reductions. A methodology on California Deltaic and Coastal Wetland Restoration is currently in development. No coastal wetland project is registered in the ACR yet, but the ACR provides the technical framework to record a wetland carbon project.

4.3 Sources of funding

Some private actors are engaging directly with projects to initiate new carbon offset methodologies to reduce and account for carbon emissions, such as for example the Livelihoods Fund, see case study 1. They are investing in offsets that their company will ultimately buy.

Public funding: New public sector market actors are currently experimenting with government-to-government carbon payments beyond the scope of traditional United Nations processes.[25] National and sub-national governments, as well as multilateral public agencies act as both buyers and suppliers, being responsible for 15% of offset transactions as project developers, and having financed 19% of all offsets purchased or financed.[26]

Public entities also invest in the development of new methodologies, as for example the Louisiana Coastal Protection and Restoration Authority (CPRA) who is responsible for the development of the Methodology for Coastal Wetland Creation, v1.0 (VCS).

Case Study 4: Luling Oxidation Pond Wetlands Assimilation System, Louisiana, USA

Tierra Resources is working with Entergy Corporation to apply the new ACR wetland restoration methodology to a pilot project known as the Luling Oxidation Pond Wetlands Assimilation System. The privately-owned project site will redirect treated municipal wastewater into an adjacent 950-acre wetland property to restore the hydrology of the wetland and boost plant and soil productivity. Carbon credits are expected to be issued in 2015.

Mangroves, Brazil
© Enrico Marone

4.4 Types of contracts

Important for project developers are the terms of delivery of a carbon offset contract that set the framework for when payments will be made. For example, for communities involved in offset projects, the so-called *Forward Crediting of Ex-ante Offsets* is of interest. The purchase price of an offset is paid upfront and is not repaid in case of delivery shortfalls. This of course bears a high transaction risk for the buyer, hence donors who do not depend on exact emission reductions are more likely to invest in this type of project, than buyers who are looking to offset a precise amount. Other types of contracts include the *Prompt Delivery of Existing Offsets,* normally within a few days. Here the provider invests into the project upfront. Through the *Forward Delivery of Future Offsets* the offset provider commits to deliver emission reductions to the buyer at a pre-defined time and price.

Case Study 5: Ecosystem Restoration Concessions (ERC) in Katingan, Indonesia

In Central Kalimantan, the Indonesian Government has identified several large peat swamp forest areas to be managed under Ecosystem Restoration Concessions (ERC) with private companies. These concessions are granted for 60 year periods and can be extended by another 35 years, thus providing reduced risk of non-permanence. An example is a 108,000 ha ERC in Katingan, allocated to the Indonesian company Pt Rimba Makhmur Utama. Main activities in these ERC areas will be peatland rewetting, reforestation and conservation. The areas were earlier destined to be deforested and converted to agricultural (i.e. palm oil) or forest plantation (Acacia) uses. The ERCs thus result in avoided emissions (by conservation of remaining forests and undrained peat soil), emission reduction (by rewetting peatlands, thus stopping ongoing emissions), and carbon sequestration (by forest regeneration and reforestation). The project financing comes from local companies and international investors such as Permian Global. The carbon credits generated will cater for the voluntary carbon markets (and in future to any compliance markets that will open up to this business). As such these private sector projects provide a for-profit solution. The projects create many co-benefits including biodiversity conservation and sustainable community development, and they aim for both VCS as well as CCBA certification.

5 Coastal wetland projects in the context of biodiversity finance

5.1 About biodiversity conventions

The two main international biodiversity related regimes are the Convention on Biological Diversity (CBD) and Convention on Wetlands of International Importance, referred to as the Ramsar Convention.

The CBD sets the framework for international action to preserve and better manage biodiversity and natural resources. In 2010, the CBD invited countries to incorporate marine and coastal biodiversity into national climate change strategies and action plans and to promote ecosystem-based approaches to climate change mitigation and adaptation.[27] This provides a basis for the development of joint carbon mitigation and biodiversity projects and highlights the need for integrated national climate change programs which use ecosystem-based approaches, such as carbon wetland activities, within the context of climate change and conservation of biodiversity. [28]

The topic of adequate finance for biodiversity is a topic of constant debate in the CBD. Sources for financial support for the ten year CBD Strategic Plan for Biodiversity (2011-2020) have been identified under the framework of the resource mobilization strategy. Countries are currently working to materialize this strategy into practice. The main financial mechanism for the CBD is the GEF (see 6.2)

Ramsar is a global intergovernmental treaty that promotes the conservation and wise use (sustainable use) of all wetlands through local and national actions and international cooperation. The Contracting Parties to the Ramsar Convention have adopted a number of Resolutions that have relevance to coastal carbon management as well as biodiversity and wetlands management at large.

At its 12th meeting of the Ramsar Contracting Parties (June 2015) the COP encourages them "to incorporate financial and other resource requirements, as appropriate, for wetland conservation, restoration and management activities related to disaster risk reduction into long-term investment programming, while ensuring the inclusion of measures to prevent adverse environmental or social impacts".[29]

The Ramsar Convention does not directly fund projects, but maintains three direct assistance programs for small projects (or parts of larger projects) for the conservation and wise use of wetlands. While not able to fund a full size carbon project or a national program, these smaller funds could be used to support and improve specific activities, like e.g. outreach and training.

(1) The Small Grants Fund supports projects from around the world, both through direct assistance and through seeking donors for additional proposals. Since 1990, the Fund has provided over 8 million Swiss Francs to over 240 projects from 110 countries.

(2) The Wetland for the Future training capacity building programme, funded by the United States State Department and Fish and Wildlife Services, supports small capacity building projects in Latin America. The grants range from 5,000 to 20,000 USD.

(3) The Swiss Grant for Africa assists the Secretariat's Africa regional team in facilitating specific activities in that region. The last report dates back to 2009.


© T. Agardy

5.2 About international biodiversity and conservation funds

5.2.1 GEF Trust Fund

As previously outlined, the GEF supports developing countries to meet the objectives of international environmental conventions such as the UNFCCC (4.2) as well as the CBD. The relevant Focal Areas (FA) related to biodiversity and conservation are outlined below.

The goal of the **Biodiversity FA** strategy is to maintain globally significant biodiversity and the ecosystem goods and services that it provides to society. The agreed programming targets for GEF-6 for the biodiversity FA is $1.296 billion.[30] The biodiversity FA is of relevance to all wetland conservation and restoration activities.

The goal of the GEF-6 **Strategy for Sustainable Forest Management (SFM)** is to achieve multiple environmental, social and economic benefits from improved management of all types of forests and trees outside of forests. The GEF is targeting forest activities that address issues in a holistic manner and recognize the links between poverty alleviation and the sustainable management of forest resources.[31] This FA is of specific relevance to mangrove forests as well as forested peatland areas.

The International Waters (IW) FA helps countries jointly manage their transboundary surface water basins, groundwater basins, and coastal and marine systems to enable the sharing of benefits from their utilization. The long-term goal is to "promote collective management of trans boundary water systems and implementation of the full range of policy, legal, and institutional reforms and investments contributing to sustainable use and maintenance of ecosystem services".[32] The IW FA can be accessed for coastal wetlands, showing the replication and transboundary conservation and restoration elements of coastal carbon projects. One of the recently funded projects in this area is the GEF Blue Forest project.

The GEF IW FA supports the implementation of various conventions and agreements, including the CBD, the RAMSAR Convention, and the UN Convention on the Law of the Sea (UNCLOS).

Project proposals under the FA IW are not part of the STAR Allocation, but are subject to the general GEF project cycle and approval processes.

5.2.2 GEF Small Grants Program

The GEF Small Grants Program, established in 1992, embodies the very essence of sustainable development by "thinking globally, acting locally". The program provides grants of up to $50,000 directly to local communities including indigenous people, community-based organizations and other non-governmental groups for projects in Biodiversity, Climate Change Mitigation and Adaptation, Land Degradation and Sustainable Forest Management, International Waters and Chemicals.

5.3 About other national and multinational environmental funds

Financial support for biodiversity projects is also provided through national environmental funds, created, or planned to be created, by countries. The combination of biodiversity and carbon funds can leverage additional resources for activities with a win/win situation for biodiversity as well as climate change mitigation and adaptation.

The CBD, as part of its call to countries to consider the enhancement of existing, or the establishment of new, domestic funds and funding programs[33], has listed a suite of funding programs on its website, categorized by region. Whereas most developing countries have established a domestic biodiversity funding system, many developing countries are still in the process of doing so. Depending on the country, immediate opportunities for receiving funding for joint biodiversity/climate change activities via national funds do not exist yet.

6 Wetlands projects and programs in the context of other innovative, non-market related financing options

Another form of biodiversity funding, which could be coupled with benefits for climate change mitigation and adaptation, is through debt relief and risk sharing and transfer, including debt for-adaptation swaps; blue bonds, catastrophic hazard bonds, and insurance mechanisms.

6.1 Debt-for-nature swaps

Debt for nature swaps emerged during the Latin America's debt crisis in the 1980s' as a financial mechanism to limit steep shortfall reductions in highly indebted nations' environmental and conservation budgets. It was an innovative idea that ameliorating debt and promoting conservation could be done at the same time.[34] This form of finance has been used to fund environmental conservation in many developing countries.[35] Wetland conservation for adaptation and carbon sequestration could now be considered as an additional objective for project activities funded under these types of initiatives.

Typically a debt-for-nature swap involves a lending country selling the debt owed by a recipient country (the debtor) to a third party (for example a non-profit organization) at less than the full value of the original loan. In exchange, the national government of the indebted country agrees to a payment schedule on the amount of the debt remaining, usually paid through the debtor's central bank, in local currency or bonds. The third party then uses the debt repayments to support domestic conservation initiatives. Highly indebted countries have the possibility to work with willing commercial banks that are aware that these countries are unlikely to ever repay their monetary debt in full.[36] Lessons learnt from earlier nature swaps have shown mixed results in terms of financial and environmental benefits.

Before embarking into debt for adaptation and mitigation swaps, a number of factors need to be considered, including the high transactions costs associated with debt swaps compared to the amount of debt forgiven and actual impact on debt relief overall, the need to ensure that the debt swap generates additional new funding and is not a substitute for existing bilateral and other forms of conservation of climate finance (e.g. public funding and ODA), and that it is part of an overall debt management strategy and conservation and climate finance strategy. Some of the benefits of properly structured debt swaps can be a long term flow of investments to conservation activities which may have been otherwise used to service the debt (in some cases leading to unsustainable natural resources exploitation), with the possibility of leveraging of additional funding.

Important success factors to generate anticipated conservation and climate change benefits are strong political leadership, internal government coordination, the need to ensure the conditions associated with the debt swap are realistic and align with existing national environmental and climate policies and programmes, stakeholder engagement and good governance in the management of the conservation funds and availability of technical assistance to implement the conditions of the debt swaps. The role of ecosystems and nature-based solutions in promoting climate mitigation and adaptation has seen a renewed interest in debt-for-nature swaps, as a one of the funding mechanism for climate finance.

Case Study 6: The Seychelles debt swap for Conservation and Adaptation

The Seychelles is an archipelago nation of 115 islands in the Western Indian Ocean about 100 miles off the coasts of East Africa and North of Madagascar. With an Exclusive Economic Zone of 1,374,000km^2 it is not surprising that ocean and coastal areas occupy a major place in the identity, and daily life of Seychellois and the country's economic activity, most importantly fisheries and tourism. Both sectors are relying on healthy marine and coastal ecosystems and are highly vulnerable to climate change impacts, such as tropical storms, at very high costs to the country 's economy and environment. For example the 1998 El Niño which resulted in a major coral bleaching event left stretches of coastline vulnerable to erosion, tropical storms and flooding and the 2013 by Tropical Storm Felleng, which caused widespread flooding, resulting in approximately $8.3 million worth of damages and losses, with knock-on effect on tourism, agriculture and fisheries sectors as well as health, fresh water supplies and other infrastructure. Such events are placing a strain on the country limited capacity for responding to climate change challenges, and effective policies and measures to protect oceans and coasts need to be put into place as part of an overall climate change strategy and finance.

The Seychelles Debt Swap for Conservation and Adaptation between the Government of the Seychelles and the Club of Paris, developed through the platform of the Global Island Partnership, with the technical support from The Nature Conservancy (TNC) is to develop a long term funding stream for conservation activities, which will help build climate resilience. TNC supported the Government of the Seychelles in successfully negotiating an approximately US$30 million debt buy back with its Paris Club creditors, to be funded via a combination of US$23 million of impact capital (provided by TNC) and the remainder in grants. The cash flow from the debt swap will provide approximately $400,000 per year in sustainable financing for marine conservation and ecosystem-based adaptation to climate change in marine and coastal systems in the Seychelles as well as capitalize a US$10 million endowment (after 20 years). Furthermore, TNC is negotiating with the European based multi-lateral Bank to replace TNC's loan with a lower cost loan that will provide an additional US$4.1 million over 20 years (or US$200,000 per year) to finance activities on the ground.

The Debt Swap focuses on a strategic intervention at the seascape scale in support of a blue economy in a changing climate. The main activity supported by the debt swap in its first phase is a government led Marine Spatial Planning (MSP) process to identify critical areas for biodiversity to be protected in a network of marine protected areas (30% of the EEZ), including no take zones (15%), as well as coastal habitats strategically located for climate adaptation (with potential carbon sequestration co-benefits) aimed at buffering the impacts of tropical storms, protecting coastlines, securing local fisheries, water supplies and critical infrastructure.

Lessons learnt from the Seychelles debt swap for conservation and adaptation so far are the critical importance of high-level political leadership, a preventive and strategic approach, alignment with government policies, and has a well-coordinated governance structure for implementation. Such initiative contributes to the implementation of the Seychelles global commitments under the Post 2015 Development Agenda and Sustainable Development Goals (including the SDG 14 on oceans) as well as commitments under the UNFCCC Climate agreement to be negotiated in Paris in December 2015. Some issues for future consideration in the success of the Seychelles debt swap process are: whether the investment flows generated are sufficient and justify the high costs of setting up the financial mechanism, how it is integrated into an overarching debt management and funding strategy, the ongoing technical support necessary to sustain the implementation of the conditions of the debt swap.

Further reading

Subrahmanyam, M.G, Yondjun Tang, D, Quin Wang S. (2014): does the tail wag the dog?: the effect of credit default swaps on credit risk, The Review of Financial Studies, Vol 27, no 10, Oxford University Press

Cassimon, D, Prose M, Essers, D (2009): The pitfalls and potential of debt for nature swaps a US –Indonesia case study, Working paper, Institute of Development Policy and Management, University of Antwerp

Moseley, B, (2006): Debt for nature Swaps: a Critical approach: comparative Environment and Development Studies: A seminar in cultural and Political Ecology (Geo 488/ES 477)

6.2 Other non-market funding sources

Other non-market funding sources include philanthropy, including grants from private foundations, business-related foundations, and large conservation NGOs, or Overseas Development Assistance (ODA). The scale of finance available from philanthropic donors is not likely to be large, unless long-term commitments towards, e.g. dedicated solution or research centres, are signed. Each foundation has its own application schedule and requirements.

Kenya
© James Kairo

Outlook - “Blue bonds” as a financing option

By Torsten Thiele, Global Ocean Trust

Capital markets allow multilateral organisations, governments, corporates and projects to access finance at scale. In 2014 so-called “green bonds” under the Climate Bonds Initiative raised over US$30bn, giving institutional investors such as pension funds an opportunity to support low-carbon growth through their investment choices.

General best practice is available from the general Climate Bonds Standard documentation, and from the Green Bond Principles (in particular “Green Bonds, Working Towards a Harmonized Framework for Impact Reporting”, March 2015). In order to apply this approach beyond renewable energy finance to the broader issues of the management of land and natural resource (soil, plants, animals, water, air) the Climate Bonds Initiative’ is presently finalizing proposed eligibility criteria for Agriculture, Forests and Land-Use (“AFOLU”) investments linked to certified Climate Bonds.

‘AFOLU-related investments’ expressly include management of wetlands and mangroves and coastal and riverine fisheries, thus financings in this area can be considered Blue bonds provided that all of the following conditions are met:

- The investment results in land and natural resource management that directly contributes to reducing atmospheric Greenhouse Gas concentrations (GHGs), consistent with avoiding dangerous climate change, and, at minimum, has a net positive impact on mitigation (i.e. net GHG reduction).

- The issuance should demonstrate significant attention to climate risks and a clear plan for achieving a positive effect on adaptation capacity and socio-ecological resilience in a manner consistent with international, national and sectoral priorities and other relevant, scientifically robust guidance.

- There is periodic and independent third-party assessment by accredited assessors of alignment between (i) stated uses and objectives for bond proceeds and (ii) actual activities and outcomes (direct, relevant impacts) supported by bond proceeds.

- There is a neutral (at minimum) or positive net impact experienced by stakeholder groups in local communities and a neutral (at minimum) or positive net effect on biodiversity and regulating ecosystem services (e.g., water supply, air quality). Compliance is maintained with all existing relevant regulations.

Proceeds from such financings can be applied in a wide variety of ways, which can include - acquisition, restoration, installing and upgrading enhanced information systems for observation and early warning or to promote resource use efficiency, e.g. minimize waste;

- protecting or enhancing natural buffers in coastal and riverine zones (e.g. mangroves, sea grass, corals) and restoring wetlands to reduce impacts of sea level rise, flooding, storm events;

- introducing new agricultural techniques to restored wetlands, to keep them in production while saving the carbon stock;

- fostering sustainable aquaculture practices (including input sourcing and management);

- creating micro-credit and insurance mechanisms to help land users cope with extreme events and other similar options.

7 Wetlands projects and programs in the context of other innovative, market-related financing options

Besides direct climate mitigation finance (either market or non-market, as discussed previously), other innovative financial mechanisms for the conservation of coastal wetlands include: payments for ecosystem services (PES - sometimes referred to as MPES in the marine domain); the promotion of "green" products and markets; the use of risk transfer and insurance mechanisms and mitigation actions, such as biodiversity offsets. In addition, government-led implementation of marine spatial plans and other comprehensive and multi-sectoral ecosystem-based management approaches can also provide access to new forms of finance or additional revenue streams for conservation.

7.1 Payment for Ecosystem Services

When ecosystem services being generated by coastal wetlands have enough value to beneficiaries to spur investment in their protection, payment mechanisms can be crafted to generate new or additional fund flows for conservation. Creating such arrangements requires first an assessment of services – i.e. what benefits are being generated, and how are they being impacted by human activity (both positive, in terms of community-based or government-driven management, and negative, in terms of direct and indirect pressures driving ecosystem degradation). Subsequent to assessment, key ecosystem services can be quantified in terms of their monetary and non-monetary value. Both the ecosystem services assessments and the valuations can then provide a basis for development policies, permitting, and regulations, or marine spatial and protected area plans. In certain instances this information can indeed form the basis for PES contracts in which those responsible for management (be they users, communities, or management agencies) act as sellers of ecosystem services, to be compensated by the beneficiaries that act as buyers of services.

As in PES occurring in forested lands and other terrestrial biomes, MPES represents the culmination of a complex set of negotiations between buyers, sellers, project developers, and enablers. Generic criteria for evaluating whether the conditions are right for exploring MPES are provided in the Getting Started in Coastal and Marine PES Primer.

PES is meant to reward those people who are managing their natural systems well, so they keep providing ecosystem services. In the marine context (MPES), PES typically involves a beneficiary of ecosystem services, for instance dive tourists, who pay for the 'use' of an ecosystem service or access to undamaged biodiversity through a user fee. This is distinguishable from conventional user fees, however, in that the funds flows go directly from beneficiaries (in this case, divers) to those providing the ecosystem service (such as fishing cooperatives, who might create a voluntary set-aside, for instance). Unlike conventional user fees that are retained and managed by government agencies responsible for the target area's management, these PES funds do not get diverted to other places or initiatives, but are rather used in a measurable way to deliver benefits to buyers.[37] While many examples of user fees in marine areas, especially marine protected areas exist, other types of PES are less common, although interest in the tool is growing.[38]

In the universe of interpretations of what constitute 'real' PES and market-like mechanisms to protect coastal habitats like mangroves and wetlands, it should be noted that not all payments are monetary, and can include bartering for access to resources. Similarly, conservation incentive agreements

Case Study 7: Socio Manglar, Ecuador

In Ecuador, the program *Socio Bosque*, initially enacted in 2008, has emerged as one of the country's key policies to intensify forest protection among communities and individuals. The program extends to native forests, moorland and other vegetation formations, including – since 2014 –mangroves (*Socio Manglar*). Beneficiaries need to sign a preservation and protection agreement having a duration of 20 years (for *Socio Manglar*: 10 years). For mangrove forests, only holders of Sustainable Use and Custody Agreements are eligible. The target of *Socio Manglar* is ambitious: It attempts to have at least 100,000 hectares of mangrove forest under agreement by 2018. Successful candidates receive a mix of fixed and variable payments. The yearly fixed payment amounts to 7,000 USD for areas between 100 and 500 hectares, 10,000 USD for areas between 501 and 1,000 hectares, and 15,000 USD for areas above 1,000 hectares. The variable payments depend on the actual size of the area under agreement and amounts to 3 USD per hectare per year. Continued payments are conditional on successful evaluation, but note that currently a carbon assessment of any sorts is not part of either the Sustainable Use and Custody Agreements or the subsidy payments.

Socio Bosque/*Socio Manglar* have so far (in parts) shown robust results, but the rollout is slow, and wide segments of the local population are (so far) excluded. The target to reach 100,000 hectares within four years seems overly optimistic. It may only be reached, if the process for accessing *Socio Manglar* (which currently requires the pre-existence of a sustainable use and custody agreement) will be simplified; the effective period extended (above 10 years); and a mechanism included, which targets the reforestation of abandoned and illegal shrimp ponds.

By mid-2015, 7.440 ha of mangrove areas were included into *Socio Bosque/Socio Manglar* in 6 concessions with an annual incentive of US$ 102 322.

MAE 2015. Las concesiones de manglar en el Ecuador: avances y desafíos. Subsecretaría de Gestión Marina Costera. Ministerio del Ambiente. Presentación PPT

IUCN (2015) Mapping of relevant policies and regulations for coastal carbon management in 5 countries: From climate change to forestry and coastal marine resource management. ECUADOR. Draft report.

Garcia, F. 2015. Programa Nacional de incentivos Socio Bosque: Capítulo socio Manglar. Ministerio del Ambiente. Presentación PPT.

are being tested as a means of allowing interested parties to pay local managers (e.g. chiefs and community leaders) for maintaining minimum amounts of coral reef quality (see www.onereef.org)

Some of the more promising initiatives in the valuation of and payment for these services are national PES mechanisms that combine various ES, such as carbon sequestration with biodiversity conservation and/or water provisioning services. Several countries are now also beginning to include marine & coastal ecosystems under these payment mechanisms. For example, for years Costa Rica's national PES scheme has focused on forests and carbon sequestration with linkages to biodiversity and water provisioning services, where mangroves are now starting to studied for potential inclusion in future PES be included.[43]

Similarly in Mexico, where the focus has been on PES to support biodiversity conservation linked to poverty reduction, biodiversity and hydrological services, such payments are already being made in some marine and coastal sites, and mangroves will be included under future national climate change adaptation and also mitigation programs, including perhaps REDD+ at some point. For example, the National Forestry Commission (CONAFOR) has been making PES to communities located in or adjacent to

mangroves for a number of years, including via its program of counterpart/matching funds (fondos concurrentes), such as in Tamihua, Veracruz for the protection of 2,800ha of mangroves and associated wetlands. [39]

Another example is that of Socio-Manglar, in Ecuador, which is an extension of the national Socio-Bosque program, and is described in Box 7.

In cases where proper MPES is being instituted and financial payments are going from buyer to seller of ecosystem services, economic valuation may set the stage for negotiating the price. It should, however, be noted that valuation of ES does not equate with a willingness to pay for these services, given that they are typically viewed as externalities or public goods, and with the exception of carbon/blue carbon sequestration services, the benefits are felt locally or nationally versus internationally.

The CBD summarizes a list of national initiatives having established PES, or are in the process of doing so. Most large NGOs (e.g. CI, TNC, WWF) as well as local NGOs and governments have invested and implemented several successful PES schemes for wetlands.[40]

Further reading

Forest Trends and The Katoomba Group (2010) Payments for Ecosystem Services: Getting Started in Marine and Coastal Ecosystems: A Primer.

Mohammed, E. 2014. Economic Incentives for Marine and Coastal Conservation: Prospects, Challenges, and Implications. Routledge; London

Parker, C., Cranford, M., Oakes, N., Leggett, M. ed., 2012. The Little Biodiversity Finance Book, Global Canopy Program; Oxford.

Marine Ecosystem Services Partnership (MESP) – a virtual center for information and communication on the human uses of marine ecosystems around the world

Annapolis, USA
© Conservation International/photo by Sarah Hoyt

Case Study 8: Incorporating the benefits of nature into risks models

Billions of dollars are invested to reduce risks from coastal hazards and climate change, creating both threats and opportunities for natural systems. Hazard mitigation has not traditionally considered natural systems as part of the solution of to protect coastlines and reduce risks. Government and business are increasingly interested in identifying where nature-based solutions can be used cost effectively, as part of a strategy for coastal defense. Traditionally, coastal hazard managers and the insurance and engineering industry sectors have not considered natural systems or their degradation in their risk assessment models. These sectors have often also not considered the value or cost effectiveness of natural solutions to prevent and or reduce risks, enable longer term planning and incentivize public and private investment in adaptation and nature-based solutions.

TNC's collaboration with the re-insurance and engineering sectors aimed to understand whether incorporating natural ecosystems in risk and cost effectiveness models could improve the assessment of disaster risks and solutions. Incorporating nature into risk and cost effectiveness models would inform not only insurers, but also lenders and development banks seeking better assessment of risk and cost effective solutions in their climate investment portfolios.

Under a joint initiative Swiss Re and TNC assessed climate risk and quantified the cost and benefits economics of coastal adaptation options across the Gulf of Mexico, USA. Coastal hazards from relative sea level rise and changes in storms, contribute the most to future risk. After quantifying climate risk and its drivers, the cost and benefits of coastal adaptation options were assessed Gulf-wide, including nature-based or green options (e.g. wetland restoration), gray or artificial defenses (e.g. seawalls) and policy alternatives (elevation of homes). Nature-based options were some of the most cost effective at avert significant future damages.

The use of online geospatial tools for risk planning can assist decision makers understand hazards, risk to socio-economic and environmental assets, and identify areas where conservation and risk reduction and climate change adaptation goals can be jointly met (for an example in the Gulf of Mexico, see TNC coastal resilience tool). Such tools could consider mitigation benefits provided by natural ecosystems as well.

McIvor, A, Moller, I, Spencer T., Spalding M. 2012. reduction of swell and waves by mangroves. Nature protection series: Report 1. Cambridge Coastal Research Unit Working Paper 40. The Nature Conservancy and Conservation International

Reguero, B.G., D. Bresch, M.W. Beck, J. Calil, I. Meliane. 2014. Coastal risks, nature-based defenses and the economics of adaptation: an application in the Gulf of Mexico, USA. Coastal Engineering Proceedings 34:1-15.

Reguero, B.G., I. Losada, P. Diaz Simal, I. Mendez, F. Javier, M. W. Beck. 2015. Effects of climate change on exposure to coastal flooding in Latin America and the Caribbean. PLoS ONE 10(7): e0133409. http://dx.doi.org/10.9753/icce.v34.management.25

Calil, J., M. W. Beck, M. Gleason, M. Merrifield, K. Klausmeyer, and S. Newkirk. 2015. Aligning Natural Resource Conservation and Flood Hazard Mitigation in California. PLoS ONE. 10(7): e0132651.

World Bank. In press. Coastal and marine ecosystem accounting: incorporating the protective service values of mangroves and coral reefs in national wealth accounts. Beck, M. W., G. M. Lange (editors). World Bank, Washington, DC.

7.2 Disaster and climate risk sharing and insurance

Risk financing and risk transfer mechanisms including insurance have been mostly considered in international negotations under the context of Disaster Risk Reduction (DRR). The United Nations Sendai Framework for Disaster Risk Reduction 2015-2030, adopted in March 2015, advocates prevention and preparedness including the role of ecosystems and land use planning as legitimate measures in risk management and environmental degradation as an important element of disaster risk reduction. The Framework also recommends that risk transfer and insurance mechanisms be included as part of any national and local disaster risk management and financing strategy (Para 30(b)). The effects of climate change on risk and risk transfer have been important parts of the UNFCCC negotiations in many programmes and work packages including loss and damage discussions.

Risk transfer mechanisms such as insurance are one of the range of market-based financial tools to consider for sharing and even reducing climate related risks. The first step in risk reduction and adaptation is accurately assessing risk; risk (e.g., of coastal development and coastal hazards) is often undervalued, which incentivizes risky behavior.[41] The insurance sector has been a leader in working to accurately price risk (and risk reduction measures) in their products, which can enable public and private incentives to reduce risks. These incentives might include public investments in preventive risk reducing and preparedness measures (including land use planning and nature-based solutions). For example, the Caribbean Catastrophic Risk Insurance Facility (CCRIF) enables risk reduction by providing governments with access to information on hazards impacts on populations, land areas and infrastructure. The CCRIF also pools risk and provides for quick payouts in the event of a disaster in the participating nations. Reviews of public investment and risk finance in selected countries conducted by UNISDR recommend a packaged approach to disaster risk finance. Such risk sharing mechanisms designed for disaster risk reduction and climate change adaptation can also contribute to climate mitigation finance and blue carbon projects.

Further reading

The Sendai Framework for Disaster Risk Reduction 2015-2030. United Nations.

UNISDR 2015. Review of the Seychelles, Working Paper on public investment planning and financing strategy for Disaster Risk Reduction, United Nations.

Suarez, P. Linneroooth-Bayer, J. 2011. Global Assessment Report on Disaster Risk Reduction (GAR 2011): insurance –related instrument for disaster risk reduction, ISDR, United Nations

7.3 Using sustainable supply chain efforts to increase private investment

There is a growing opportunity for making a business case to donors, investors and the private sector regarding products associated with the sustainable use and conservation of coastal wetlands and associated ecosystems.

The opportunity appears most pronounced for sustainable seafood, but could also be extended to crops grown near mangroves and coastal wetlands, such as rice, sugarcane, oil palm, cattle, etc., if the production practices comply with national laws and don't result in habitat conversion or degradation.

Many food industries now worry about the security of supply in general and particularly in the face of more extreme and erratic weather conditions that are increasingly attributed to climate change. Similarly, there is growing pressure on companies, particularly large, multinational corporations, to reduce their supply chain footprints in terms of carbon, water, energy, waste, pollution, etc. And there is an increase in the demand for and use of various product and supply chain certification systems.

Of particular potential relevance are initiatives where companies, and in some cases governments, are making commitments to source products, such as soy, oil palm, beef and leather from "zero deforestation" landscapes, in some cases as the result of negative publicity and/or threats of consumer boycotts by environmental and other watchdog organizations. It is possible that such approaches could also be applied and adapted in future to seafood and aquaculture/mariculture production to reduce pressures on mangrove and coastal wetland landscapes. However, such efforts are likely to require the concerted efforts of multiple actors over an extended period, with some leading international companies being willing to make commitments of this nature and then to demonstrate changes in their sourcing (and the production practices of their suppliers) policies, most probably in some pilot landscapes that can then be expanded and replicated in other sites over time. These efforts are also likely to involve the use of sustainable seafood, such as the Marine Stewardship Council (MSC), and aquaculture, (such as the Global Aquaculture Alliance (GAA)/ Aquaculture Certification Council (ACC) standards.

Governments could also require companies that have a history of illegal management practices in the aquaculture and agriculture sectors, which have converted or degraded mangroves and coastal wetlands to participate in such programs and also to contribute financially to such programs and habitat conservation and restoration, with the threat of legal sanctions acting as an incentive for participation and compliance. The success of such an approach would largely dependent upon the quality of legal enforcement, and also the activities of national and international watchdog and media organizations.

7.4 Biodiversity offsets

A biodiversity offset is a way to demonstrate that an infrastructure project can be implemented in a manner that results in no net loss or a net gain of biodiversity. Biodiversity offsets can be defined as "measurable conservation outcomes of actions designed to compensate for significant residual adverse biodiversity impacts arising from project development after appropriate prevention and mitigation measures have been taken. The goal of biodiversity offsets is to achieve no net loss and preferably a net gain of biodiversity on the ground with respect to species composition, habitat structure, ecosystem function and people's use and cultural values associated with biodiversity".

To be an offset, these conservation outcomes should be quantifiable, since the purpose of a biodiversity offset is to demonstrate a balance between a project's impacts on biodiversity and the benefits achieved through the offset. This involves measuring both the losses to biodiversity caused by the project and the conservation gains achieved by the offset.

The Business and Biodiversity Offsets Programme (BBOP) is a collaboration of

Case Study 9: Climate change mitigation through Building with Nature?

By Pieter van Eijk, Wetlands International

Hundreds of billions of dollars are spent each year in support of large infrastructure works along coasts to increase coastal safety and support coastal development. Shifting these investments towards integrated solutions that apply ecosystem management and restoration alongside infrastructure-based approaches, offers substantial opportunities for boosting mitigation benefits provided by coastal wetlands. In recent years, interest in such approaches, known as Building with Nature, has been on the rise. There is increased recognition that working with and alongside nature, rather than fighting against it through rigid single-sided approaches increases cost-effectiveness and provides major ancillary benefits, including carbon mitigation. Countries like the Netherlands and the United States have implemented a range of solutions, including oyster reefs, salt-marsh foreshores in front of dykes, reconstruction of barrier islands and sediment nourishments on beaches. Also in tropical countries such as Bangladesh and Indonesia such approaches gain popularity.

For example, partners of the Ecoshape consortium, together with the Indonesian Ministry of Marine Affairs and Fisheries and the Ministry of Public Works, have embarked on a major project to secure a heavily eroding coastline in Demak. Following conversion of mangroves, and subsequent aquaculture development, a 20km coastline has retreated by more than a kilometre in a few years' time. Two villages have disappeared. More than 60.000 people are at risk. Dykes are too expensive to serve this rural coast. Mangrove planting has failed, as the coast has become too much exposed to the forces of the waves. Partners are now testing an integrated approach in the area: grids of permeable dams made of brushwood trap sediment, trap sediment and create a sheltered substrate on which mangroves can settle naturally. Sustainable sediment nourishments will be implemented to further nourish the coast. In parallel, the programme introduces more sustainable land-use regimes, by integrating mangroves in existing aquaculture systems. Although the exact carbon footprint of the initiative needs to be established, it is expected to result in substantial avoided emissions from the carbon rich soil, as well as in significant carbon sequestration in living biomass.

On the basis of this and other cases it is expected that major mitigation benefits could be generated if funds for coastal engineering would be earmark according to Building with Nature principles. Guidance for maximising carbon storage and sequestration coastal zone management designs and related tender documents could substantially raise the profile of blue carbon solutions across the world.

Vriend, H.J. de & M. van Koningsveld, 2012. Building with Nature. Thinking, acting and interacting differently. EcoShape, Building with Nature,Dordrecht, the Netherlands.

Wesenbeeck, B.K. van, Balke T., Eijk P. van Tonneijck, F. Siry, H.Y., Rudianto, M.E. & Winterwerp J.C., 2015. Aquaculture induced erosion of tropical coastlines throws coastal communities back into poverty. Ocean & Coastal Management 116, pp. 466-469.

more than 80 leading organizations and individuals including companies, financial institutions, government agencies and civil society organizations, who are members of its Advisory Group. Together, the members are testing and developing best practice on biodiversity offsets and conservation banking worldwide. BBOP has produced an extensive glossary of terms defining many key terms related to biodiversity offsets.

There is no single best way to design and implement biodiversity offsets, since offsets require a flexible but principles-based approach. However, a general eight-step framework for a typical prospective offset design process that can help developers satisfy the Principles. In addition, offset designers can be guided by the Standard on Biodiversity Offsets, which will help them plan and implement an offset that meets best practice.

To date no examples of purely marine biodiversity offsets exist, though the idea has been piloted in several regions. However, wetlands have been included in biodiversity offsets, in areas where industries have gone through the mitigation hierarchy, determined what unavoidable impacts to biodiversity exist, and created offsets that follow the principles of biodiversity offsets and the criteria for determining equivalency.

Further reading

More detailed material can be found in BBOP's handbooks on offset design and implementation at http://bbop.forest-trends.org/pages/guidelines.

ICMM IUCN (2012) Independent report on biodiversity offsets. Prepared by The Biodiversity Consultancy.

IUCN (2014) Biodiversity Offsets Technical Study Paper. Gland, Switzerland: IUCN. 65pp.

ten Kate, K. and Crowe, M.L.A. (2014). Biodiversity Offsets: Policy options for governments. An input paper for the IUCN Technical Study Group on Biodiversity Offsets. Gland, Switzerland: IUCN. 91 pp.

Pilgrim, J. D. & Ekstrom, J. M. M. (2014). Technical conditions for positive outcomes from biodiversity offsets. An input paper for the IUCN Technical Study Group on Biodiversity Offsets. Gland, Switzerland: IUCN. 46pp.

7.5 Finance in the context of coastal and marine spatial planning

Coastal nations have engaged in coastal planning for decades – most have developed national coastal zone management acts and legislation, and many have legal frameworks in place for co-management, such that government agencies and local communities share the burden of management and monitoring. More recently, coastal countries have adopted marine spatial planning (MSP), to decide how to allocate access to space and resources in the offshore areas within their jurisdiction. Both coastal management plans and ocean zoning plans that derive from MSP can set the stage for generating new fund flows for conservation – especially for community-based conservation and management. This deliberative marine planning can be carried right through to support specific financing mechanisms for conservation and ecosystem services delivery – such as the creation of special zones as marine biodiversity banks – analogous to wetlands banking areas.[42] One could readily see how carbon banking areas might become yet another zone in a marine spatial plan – laying the groundwork for additional carbon financing.

Whatever metrics[43] are used in coastal and marine planning to determine priority areas, the identification of priority areas under spatial plans can lend itself to a blueprint for locating PES, offset, and even certification schemes that generate new funds flows. These financing schemes can be result of a directed effort to create ecosystem-service finance, as for example exists in Mexico's legislation allowing PES formulation, or they can flow from more general and conventional management regimes (the development of management plans for an MPA, or adoption of Ecosystem-Based Fisheries Management, Integrated Watershed Management, etc). The common denominator in all these financing schemes is that the special values of the coastal wetland is recognized, and this information is then used to incentivize improved management so as to preserve the future delivery of valuable ecosystem services.

8 A final word

Finding the adequate financial support to set up a coastal carbon project or program is not an undemanding task. However, reports like this one, or other tools and resources, are trying to ease the way through the climate finance jungle. Wetland –coastal or other – conservation and restoration efforts are more important than ever, and climate finance can help materialize some real implementation on the ground.

Climate change finance, additionally coupled and leveraged through biodiversity finance, offers a suite of funding, as well as a plethora of financial mechanisms to support the conservation and restoration of wetlands worldwide, yet is not easy to get hold off. This report tried to provide the reader interested in coastal carbon activities with a first overview of the types of finance available. The scope and scale as well as the geographical and political situation will determine which mechanism, or which combination of mechanisms, is accessible for the development and implementation of a particular wetland carbon project or program. The stated literature and reading sources provide further insights and details for the reader to engage much deeper with a specific fund and/or financial mechanism. And as a final note, it has to be borne in mind that financing for climate change, biodiversity, and water resources will remain a quickly changing subject matter for quite some years to come; and, therefore, checking the information against the latest on the provided websites is a wise approach.

Little boy walking-Mozambique
(C) R Chevallier

Endnotes

1 Tubiello, F. (2012) Climate change adaptation and mitigation: challenges and opportunities in the food sector. Natural Resources Management and Environment Department, FAO, Rome. Prepared for the High-level conference on world food security: the challenges of climate change and bioenergy, Rome, 3-5 June 2008.

2 WWF and Credit Suisse Group AG and/or its affiliates, and McKinsey & Company (2014) Conservation Finance Moving beyond donor funding toward an investor-driven approach http://conservationfinance.org/upload/library/arquivo20140127100251.pdf

3 Locatelli et al. (2011) Forests and Climate Change in Latin America: Linking Adaptation and Mitigation. Forests 2(1), 431-450. http://dx.doi.org/10.3390/f2010431

4 Parker, C., Cranford, M., Oakes, N., Leggett, M. ed. (2012) The Little Biodiversity Finance Book, Global Canopy Program; Oxford.

5 Parker, C., Cranford, M., Oakes, N., Leggett, M. ed. (2012) The Little Biodiversity Finance Book, Global Canopy Program; Oxford.

6 UNEP and CIFOR 2014. Guiding principles for delivering coastal wetland carbon projects. United Nations Environment Program, Nairobi, Kenya and Center for International Forestry Research, Bogor, Indonesia, 57pp.

7 UNFCCC Fact sheet. Financing climate change action; investment and financial flows for a strengthened response to climate change. https://unfccc.int/press/fact_sheets/items/4982.php

8 GEF (2014) Report on the sixth replenishment of the GEF Trust Fund. Fifth GEF Assembly May 28 – 29, 2014 Cancun, Mexico. GEF/A.5/07/Rev.01*

9 Freestone, D. and Streck, C. (eds) (2009) Legal Aspects of Carbon Trading. Kyoto, Copenhagen and beyond. Oxford University Press. New York. http://dx.doi.org/10.1093/acprof:oso/9780199565931.001.0001

10 GEF/LDCF.SCCF.19/03 September 25, 2015. PROGRESS REPORT ON THE LEAST DEVELOPED COUNTRIES FUND AND THE SPECIAL CLIMATE CHANGE FUND. 19th LDCF/SCCF Council Meeting

11 GEF/LDCF.SCCF.19/03 September 25, 2015. PROGRESS REPORT ON THE LEAST DEVELOPED COUNTRIES FUND AND THE SPECIAL CLIMATE CHANGE FUND. 19th LDCF/SCCF Council Meeting

12 GEF/LDCF.SCCF.19/03 September 25, 2015. PROGRESS REPORT ON THE LEAST DEVELOPED COUNTRIES FUND AND THE SPECIAL CLIMATE CHANGE FUND. 19th LDCF/SCCF Council Meeting

13 UNFCCC (2011) Green Climate Fund's "Governing instrument for the Green Climate Fund" approved by COP of the UNFCCC December 2011, Durban, South Africa, and annexed to decision 3/CP.17 (FCCC/CP/2011/9/Add.1).

14 The CDM allows emission-reduction projects in developing countries to earn certified emission reduction (CER) credits, each equivalent to one tonne of CO2. These CERs can be used by industrialized countries to a meet a part of their emission reduction targets under the Kyoto Protocol.

15 Adaptation Fund (2015) ANNUAL PERFORMANCE REPORT FOR THE FISCAL YEAR 2015. AFB/EFC.17/6/Rev.1 24 September 2015

16 As of 31 December 2012, the 50 M$ ADB financing for the CCF has been fully allocated to 60 projects: 24 on clean energy development, 9 on REDD+, and 27 on adaptation. http://www.scribd.com/doc/144370146/CCF-Supported-Projects

17 See http://mptf.undp.org/factsheet/fund/CCF00 for an overview of current funds and budget allocations.

18 German Emissions Trading Authority (2014) Carbon Market Approaches for Peatlands and Forests. Status Report I. Berlin. Germany.

19 Ecosystem Marketplace (2014) Sharing the Stage State of the Voluntary Carbon Markets 2014. Executive Summary. Washington, DC. USA.

20 Murray, B. et al. (2011) Green Payments for Blue Carbon. Economic Incentives for Protecting Threatened Coastal Habitats. Nicholas Institute for Environmental Policy Solutions, Duke University.

21 Siikamäki, J., Sanchirico, J. N., & Jardine, S. L. (2012). Global economic potential for reducing carbon dioxide emissions from mangrove loss. Proceedings of the National Academy of Sciences, 109(36), 14369-14374. http://dx.doi.org/10.1073/pnas.1200519109

22 Forest Trends' Ecosystem Marketplace. 2014. State of the Forest Carbon Market 2014.

23 Murray, B. et al. (2011) Green Payments for Blue Carbon. Economic Incentives for Protecting Threatened Coastal Habitats. Nicholas Institute for Environmental Policy Solutions, Duke University.

24 German Emissions Trading Authority (2014) Carbon Market Approaches for Peatlands and Forests. Status Report I. Berlin. Germany.

25 Ecosystem Market Place (2014) Sharing the Stage State of the Voluntary Carbon Markets 2014. Executive Summary. Washington DC.

26 Ecosystem Market Place (2014) Sharing the Stage State of the Voluntary Carbon Markets 2014. Executive Summary. Washington DC.

27 CBD COP 10 Decision X/29 Marine and Coastal Biodiversity; CBD COP 10 Decision X/33 Biodiversity and Climate Change

28 CBD COP 12 Decision XII/20. Biodiversity and climate change and disaster risk reduction

29 Ramsar Resolution XII.13 Wetlands and disaster risk reduction. COP 12 Punta del Este, Uruguay, 1-9 June 2015.

30 GEF (2014) Report on the sixth replenishment of the GEF Trust Fund. Fifth GEF Assembly May 28 – 29, 2014

Cancun, Mexico. GEF/A.5/07/Rev.01*
31 GEF (2014) Report on the sixth replenishment of the GEF Trust Fund. Fifth GEF Assembly May 28 – 29, 2014 Cancun, Mexico. GEF/A.5/07/Rev.01*
32 GEF (2014) Report on the sixth replenishment of the GEF Trust Fund. Fifth GEF Assembly May 28 – 29, 2014 Cancun, Mexico. GEF/A.5/07/Rev.01*
33 CBD Strategy for resource mobilization, objective 2.5, 3.5, 3.7.
34 Lovejoy 1984
35 Parker, C., Cranford, M., Oakes, N., Leggett, M. ed., 2012. The Little Biodiversity Finance Book, Global Canopy Program; Oxford.
36 J.P. Resor. Debt-for-nature swaps: a decade of experience and new directions for the future. http://www.fao.org/docrep/w3247e/w3247e06.htm; http://www.cbd.int/financial/debtswap/
37 See for further explanation “Paying Poseidon: Financing the Protection of Valuable Ecosystem Services” available online http://www.forest-trends.org/program.php?id=135
38 Mohammed, E. 2014. Economic Incentives for Marine and Coastal Conservation: Prospects, Challenges, and Implications. Routledge; London
39 BIOMARCC-SINAC-GIZ. 2012. Evaluación de carbono en el Humedal Nacional Térraba-Sierpe. San José-Costa Rica. http://www.sinac.go.cr/documentacion/Areas%20Silvestres%20Protegidas/Estudio%20Cient%C3%ADfico%20ST01%20Carbono%20Térraba-Sierpe%20BIOMARCC%202012.pdf
40 Forest Trends & The Katoomba Group (2010) Payments for Ecosystem Services: Getting Started in Marine and Coastal Ecosystems.
41 UNISDR (2015) Review of the Seychelles, Working Paper on public investment planning and financing strategy for Disaster Risk Reduction, United Nations
42 See Agardy, T. 2007. Marine Conservation Banking and the Brave New World Before Us. Chapter 11 Conservation and Biodiversity Banking Earthscan Books, London UK
43 These metrics include measures of species richness and biodiversity, vulnerability, specific values of the area for certain users, or comprehensive values for a wide variety of users

INTERNATIONAL UNION
FOR CONSERVATION OF NATURE

WORLD HEADQUARTERS
Rue Mauverney 28
1196 Gland, Switzerland
Tel +41 22 999 00 00
Fax +41 22 999 00 02
www.iucn.org