BLUE CARBON POLICY FRAMEWORK 2.0

Based on the discussions of the International Blue Carbon Policy Working Group

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Based on the discussions of the International Blue Carbon Policy Working Group

prepared by Dorothée Herr, Emily Pidgeon and Dan Laffoley

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TERMINOLOGY

In this document Blue Carbon is defined as the carbon stored, sequestered or released from coastal ecosystems of tidal marshes, mangroves and seagrass meadows. Blue Carbon in this report and context does not include carbon stored, sequestered or released by the open ocean and closely related ecosystems and organisms.

Blue Carbon activities refer to a suite of sustainable policy, management and planning activities in coastal ecosystems to reduce emissions from conversion and degradation and to conserve and sustainably manage coastal carbon sinks.

This framework uses the term Blue Carbon for the purpose of identification of carbon-rich seagrass, mangrove and saltmarsh ecosystems. However, use of this terminology does not necessarily imply an intent to create new or separate policy or financing schemes. The framework is designed to detail how Blue Carbon activities can be integrated into existing international policy and financing processes whenever possible rather than develop or advocate for a new Blue Carbon mechanism.

TABLE OF CONTENTS

1. INTRODUCTION

Many natural environments contain large stores of carbon laid down by vegetation and other natural processes over centuries. The storage of carbon is the consequence of the capacity of those ecosystems to act as a net carbon sink over very long periods of time.

If these ecosystems are degraded or damaged by human activities, their carbon sink capacity is lost and the resulting emissions of carbon dioxide (CO2) contribute to climate change.

Conserving and restoring terrestrial forests, and more recently peatlands, has been recognized as an important component of climate change mitigation. Several countries are developing policies and programs in support of sustainable development through initiatives that reduce the carbon footprint associated with the growth of their economies, including actions to conserve and sustainably manage natural systems relevant to the United Nations Framework Convention on Climate Change (UNFCCC) and the Reducing Emissions from Deforestation and Forest Degradation (REDD+)[1] mechanism.

These approaches should now be further broadened to manage other natural systems that contain rich carbon reservoirs and to reduce the potentially significant emissions from the conversion and degradation of these systems. In particular, the coastal ecosystems of tidal marshes, mangroves and seagrasses sequester and store large quantities of Blue Carbon in both the plants and in the sediment below them. These Blue Carbon ecosystems are being degraded and destroyed at a rapid pace along the world's coastlines, which results in globally significant emissions of carbon dioxide into the atmosphere and ocean, contributing to climate change.[2]

1 Reduced Emissions from Deforestation and forest Degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries

2 Crooks, S. et al. 2011 Mitigating Climate Change through Restoration and Management of Coastal Wetlands and Near-shore marine Ecosystems. Challenges and Opportunities. Environment Department Paper 121, World Bank, Washington, DC, USA. Donato, D.C. et al. 2011. Mangroves among the most carbon-rich forests in the tropics. Nature Geoscience vol. 4, pp. 293–297. Mcleod, E. et al. 2011. A blueprint for Blue Carbon: toward an improved understanding of the role of vegetated coastal habitats in sequestering CO2. The Ecological Society of America. DOI:10.1890/110004.


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There is growing evidence and scientific consensus that the management of coastal Blue Carbon ecosystems, through reduction in emissions, conservation, restoration and sustainable use, has strong potential to be a transformational tool in effective global natural carbon management.[3] Scientific understanding of carbon sequestration and potential emissions from coastal ecosystems is now sufficient to develop effective carbon policy, management, and conservation incentives for coastal Blue Carbon. With appropriate and timely action, increased recognition of the importance of coastal Blue Carbon systems will leverage improved management and regulation of coastal areas and provide a basis for incentives, including financial mechanisms, to conserve or restore these systems and reduce emissions as well as impacts, i.e. support mitigation and adaptation to climate change.

IIn addition to their role and value as a sinks and stores of carbon, coastal ecosystems provide significant other benefits for climate change adaptation, local livelihoods, tourism and culture such as protection from storms and prevention of shoreline erosion, regulation of coastal water quality, habitat for numerous fish species and other commercial and endangered species.[4]

Development and implementation of Blue Carbon-based activities now requires strategic policy and incentive mechanisms to achieve coastal conservation, restoration and sustainable use, and provide disincentives to drain or damage coastal systems. A first effort to develop such a strategic program was set out in the first edition of the Blue Carbon Policy Framework.

Based on additional information and current progress a revised Blue Carbon Policy Framework 2.0 has now been developed.[5] It updates the previous version and adds a detailed coordinated program of policy objectives and activities. It outlines the activities needed for the integration of Blue Carbon into existing policy initiatives and the implementation of coastal management activities. The framework, described in this document, also details a timeline and identifies the possible stakeholders to further develop the activities.

3 Climate Focus. 2011. Blue Carbon Policy Options Assessment. Washington, DC, USA. Murray, B.C. et al. 2011. Green Payments for Blue Carbon. Economic Incentives for Protecting Threatened Coastal Habitats. Nicholas Institute, Duke University.

4 Barbier, E. B. et al. 2011. The value of estuarine and coastal ecosystem services. Ecological Monographs, 81(2) 169-193.

5 The Blue Carbon Policy Framework 2.0 is the revised version of the Blue Carbon Policy Framework released in 2011 (http://data.iucn.org/dbtw-wpd/edocs/2011-058.pdf). This revision is based on the discussions held at the second Blue Carbon Policy Workshop, held 10-11 January 2012 at the European Parliament in Brussels, Belgium. The following organizations and institutions were represented at the workshop: IUCN, CI, United Nations Education, Scientific and Cultural Organization – Intergovernmental Oceanographic Commission (UNESCO-IOC), Verified Carbon Standard (VCS), Climate Focus, Silvestrum, Philip Williams and Associates (ESA-PWA), Restore Americas Estuaries, MARES/Forest Trend, Wetlands International, Nicholas Institute (Duke University), Oregon State University, Florida International University, Ramsar, Coalition of Rainforest Nations, the European Commission (DG Environment, DG Clima and DG Research).

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2. BACKGROUND

The updated framework set out in the following pages describes a coordinated program to support the development and implementation of strategic policy and incentive mechanisms for conservation, restoration and sustainable use of coastal Blue Carbon ecosystems. The framework is designed to:

1. Define activities and a timeline to increase policy development, coastal planning and management activities that support and promote avoided degradation, conservation, restoration and sustainable use of coastal Blue Carbon systems;

2. Define actions and a timeline to develop and implement financial and other incentives for climate change mitigation through conservation, restoration and sustainable use of coastal Blue Carbon;

3. Identify key stakeholders, partners and Blue Carbon champions to implement the identified policy actions and define materials and products needed to support such activities;

4. Identify opportunities, limits and risks of advancing Blue Carbon in different international climate, coastal and ocean policy fora.

The framework is intended to guide and coordinate the activities of Blue Carbon stakeholders including NGOs, government, multi-lateral institutions, private sector and research institutions from the marine and the climate change communities. Not all activities are intended for all Blue Carbon stakeholders. Rather, the framework identifies different activities that are relevant for different stakeholders.

This framework will be updated as needed by the International Blue Carbon Policy Working Group in coordination with the broader group of interested stakeholders.

3. INTERNATIONAL BLUE CARBON POLICY WORKING GROUP

The International Blue Carbon Policy Working Group was formed in July 2011 to develop policy options for implementation (at international and national levels) of coastal Blue Carbon-based incentives (including financial mechanisms) and management. The working group is convened by IUCN and Conservation International (CI). The specific goals of the International Blue Carbon Policy Working Group are to:

1. Develop a strategic framework outlining key policy, program activities and financing opportunities needed to support climate change mitigation through coastal carbon management including ecosystem conservation, restoration and sustainable use; and

2. Build an integrated Blue Carbon community supporting the implementation of the Blue Carbon Policy Framework that will include climate, coastal and marine stakeholders.

To achieve these goals, the objectives of the Policy Working Group are to:

1. Identify and describe the climate, coastal and ocean policy issues and opportunities that need to be addressed to advance the conservation, restoration and sustainable use of coastal Blue Carbon ecosystems and evaluate the applicability and specific relevance of the range of existing, and potentially new, policy approaches (including climate, coastal and ocean), and financing mechanisms as tools for supporting coastal Blue Carbon conservation, restoration and sustainable use;

2. Building upon the outputs from objective 1, create a Blue Carbon Policy Framework and timeline detailing the needed policy actions required to:

    a. Increase policy development, coastal planning and management activities that support and promote conservation,restoration and sustainable use of coastal Blue Carbon; and

    b. Develop and implement financial incentives and technical support for climate change mitigation through conservation, restoration and sustainable use of coastal Blue Carbon.

3. Support the highest priority activities identified in the Blue Carbon Policy Framework either directly or through partners;

4. Identify additional policy and economic analysis needed for implementation of the Blue Carbon Policy Framework and the best partners to undertake the most immediate research priorities.

The policy working group consists of experts in coastal science, environmental policy and economics, and project implementation from within the climate change and marine communities. The Policy Working Group is informed by and complementary to the work of the International Blue Carbon International Scientific Working Group convened by CI, IUCN and the Intergovernmental Oceanographic Commission (IOC) of the UN Educational, Scientific and Cultural Organization (UNESCO).

The International Blue Carbon Scientific Working Group was formed to: determine the role of coastal vegetated ecosystems, such as mangroves, seagrasses, and saltmarshes, in carbon storage and sequestration; develop accounting methodologies and standards to encourage the inclusion of these systems in national carbon accounting; and identify critical scientific information needs and data gaps.[6]

6 The Blue Carbon Initiative is the first integrated program focused on mitigating climate change by conserving and restoring coastal marine ecosystems globally. The initiative is lead by Conservation International (CI), the International Union for Conservation of Nature (IUCN), and the Intergovernmental Oceanic Commission (IOC) of UNESCO, working with partners from national governments, research institutions, NGOs, coastal communities, intergovernmental and international bodies and other relevant stakeholders.

4. BLUE CARBON POLICY OBJECTIVES

The importance of coastal carbon management for climate change mitigation is not yet fully recognized by international and national climate change response strategies. Climate change financing opportunities are currently untapped for supporting mitigation actions for conservation, restoration and sustainable use of coastal ecosystems.

The Blue Carbon Policy Framework has five specific Policy Objectives:

1. Integrate Blue Carbon activities fully into the international policy and financing processes of the UNFCCC as part of mechanisms for climate change mitigation;

2. Integrate Blue Carbon activities fully into other carbon finance mechanisms such as the voluntary carbon market as amechanism for climate change mitigation;

3. Develop a network of Blue Carbon demonstration projects;

4. Integrate Blue Carbon activities into other international, regional and national frameworks and policies, including coastal and marine frameworks and policies;

5. Facilitate the inclusion of the carbon value of coastal ecosystems in the accounting of ecosystem services.

Coordination between activities and stakeholders is needed to ensure maximum efficiency and effectiveness of Blue Carbon mitigation actions. In the short-term the Policy Working Group can provide coordination and prioritization of international policy efforts to ensure that limited financial resources and technical expertise produce the maximum impact from implementation initiatives. In the medium to longer-term, it is anticipated that Blue Carbon policy will be integrated into existing mechanisms such as international agreements, natural carbon mitigation approaches and marine management.

The following sections describe activities and timelines to achieve these objectives in more detail.

efforts to ensure limited financial resources and technical expertise produce the maximum impact from implementation initiatives. In the medium to longer-term, it is anticipated that integration of Blue Carbon policy into existing coordination efforts and mechanisms, e.g. between international agreements, natural carbon mitigation approaches and marine management will be identified and used.

The following sections describe activities and timelines to achieve these objectives in more detail.

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5. BLUE CARBON POLICY FRAMEWORK OVERVIEW

Integrate Blue Carbon activities fully into the international policy and financing processes of the UNFCCC as part of mechanisms for climate change mitigation

- Ensure recognition and inclusion of Blue Carbon sinks and sources into the outcome of the Durban Platform
- Build awareness in the climate change policy community of the strength of scientific evidence on the carbon sequestered and stored in coastal ecosystems and on the emissions resulting from the degradation and destruction of these systems
- Enhance the scientific and technical basis (data, reporting and accounting guidelines, methodologies, etc) for financing of coastal carbon management activities
- Access carbon finance through UNFCCC mechanisms and related funding streams
- Include Blue Carbon management activities as incentives for climate change mitigation by Annex-I Parties
- Monitor discussions on agriculture, and its relevance for Blue Carbon
- Support capacity-building activities to implement Blue Carbon management activities

Integrate Blue Carbon activities fully into other carbon finance mechanisms such as the voluntary carbon market as a mechanism for climate change mitigation

Develop a network of demonstration projects

- Develop a strategic approach for the coordination and funding of demonstration project
- Provide capacity building at local/national level

Integrate Blue Carbon activities into other international, regional and national frameworks and policies, including coastal and marine frameworks and policies

- Enhance implementation and inform financing processes of relevant Multi-lateral Environmental Agreements (MEAs) that provide policy frameworks relevant for coastal and marine ecosystem management
- Use existing international frameworks to advance and disseminate technical knowledge on coastal ecosystems management for climate change mitigation
- Use existing international frameworks to raise awareness of role of conservation, restoration and sustainable use of coastal ecosystems for climate change mitigation
- Integrate coastal ecosystem conservation, sustainable use and restoration activities as a mechanism for climate change mitigation into relevant regional policy frameworks
- Integrate coastal ecosystem conservation, sustainable use and restoration activities as a mechanism for climate change mitigation into existing national, sub-national and sectoral policy framework

Facilitate the inclusion of the carbon value of coastal ecosystems in the accounting of ecosystem services

These items are new additions from the Blue Carbon Policy Framework 1.0

6. BLUE CARBON POLICY FRAMEWORK

6.1 Integrate Blue Carbon activities into the international policy and financing processes of the UNFCCC as part of mechanisms for climate change mitigation[7]

The UNFCCC, in Art 4(d), calls for Parties to "promote sustainable management, and promote and cooperate in the conservation and enhancement, as appropriate, of sinks and reservoirs of all greenhouse gases not controlled by the Montreal Protocol, including […] oceans as well as […] other coastal and marine ecosystems". Despite this mandate, coastal ecosystems have to date been largely excluded from UNFCCC related mechanisms.

A number of incentives however currently exist to support emission reductions and removals from nature-based activities under the UNFCCC: Reducing Emissions from Deforestation and Forest Degradation (REDD+), National Appropriate Mitigation Actions (NAMAs), the Land-Use, and some Land-Use Change and Forestry (LULUCF) activities including those implemented under the Clean Development Mechanisms (CDM). These mechanisms provide some incentives and financial support for national-level accounting and project-level activities including restoration and sustainable use of natural systems such as forests and peatlands.

Coastal ecosystems can be integrated into existing UNFCCC supported financing mechanisms and approaches. The creation of new mechanisms under the UNFCCC is therefore not required as existing mechanisms may support climate change mitigation through natural carbon management activities (e.g. under REDD+, NAMA etc.).

✱ 6.1.1 Ensure recognition and inclusion of Blue Carbon sinks and sources into the outcome of the Durban Platform

Background

At the 2011 UNFCCC COP17 in Durban, Parties to the Convention agreed to "launch a process to develop a protocol, another legal instrument or an agreed outcome with legal force under the Convention applicable to all Parties" through a new subsidiary body under the Convention called the Ad Hoc Working Group on the Durban Platform for Enhanced Action (AWG Durban Platform). This new working group should finalize its work as early as possible but no later than 2015. The Durban Platform will address a variety of topics on mitigation, adaptation, finance, technology development and transfer, transparency of action, and support and capacity-building,[8]

Opportunities

It is very likely that the outcomes of the new Durban Platform will incorporate current UNFCCC accounting rules as well as elements of ongoing policy and technical negotiations. To ensure Blue Carbon sources, sinks and reservoirs are fully integrated into this new global instrument, it is critical that ongoing negotiations, such as on REDD+, NAMA and LULUCF, reflect and address management of Blue Carbon systems appropriately, including conservation of sinks, (see chapter 6.1.2-6.1.7). It is expected that under the Durban Platform the contribution of natural carbon sinks and reservoirs to climate change mitigation, including coastal and marine ecosystems, will be comprehensively discussed and addressed within NAMAs. This will most likely be part of the working activities of 2013.

7 This report assumes a certain familiarity of the reader with UNFCCC mechanisms etc. Recommended background reading: Climate Focus. 2011. Blue Carbon Policy Options Assessment. Washington, DC, USA.

8 Draft decision -/CP.17 Establishment of an Ad Hoc Working Group on the Durban Platform for Enhanced Action. http://unfccc.int/files/meetings/durban_nov_2011/decisions/application/pdf/cop17_durbanplatform.pdf

To ensure that coastal and marine ecosystems are included in the outcomes of the AWG Durban Platform, the Parties to the Convention could agree to specific incentives for the sustainable management of Blue Carbon ecosystems. Such incentives should ensure that the carbon sinks and reservoirs of coastal ecosystems are conserved and sustainably managed, and that unsustainable economic activities resulting in the emissions of those carbon stocks are avoided.

Clear climate change mitigation gains can be achieved by reducing human pressure on coastal ecosystems leading to degradation and conversions, and thus reducing carbon emissions. Additionally, the conservation of Blue Carbon is particularly relevant to countries and areas with currently high intact coastal carbon ecosystems and low rates of loss or degradation. Conservation is being discussed within the context of REDD+ and should be considered as an element of the next global agreement and its mechanisms. It is in the direct interest of the Parties to any future agreement that, in addition to reduced emissions, conservation of mangroves and other Blue Carbon systems, be integrated in the discussion and outcomes under the Durban Platform.

Recommended activities

Coastal Ecosystems	Recommended Activities	Targeted Date	Stakeholders
Mangroves Saltmarshes Seagrasses	Ensure that management of marine and coastal ecosystems is appropriately included into a possible new global agreement by 2015, e.g., as part of NAMAs for developing countries	By 2015	Parties NGOs UN agencies
	Ensure incentives for conservation of active natural carbon sinks are part of the outcomes of the Durban Platform and include Blue Carbon systems	By 2015	Parties NGOs UN agencies

6.1.2. Build awareness in the climate change policy community of the strength of scientific evidence on the carbon sequestered and stored in coastal ecosystems and on the emissions resulting from the degradation and destruction of these systems.

Background

The climate change policy community is largely unaware of the scientific research detailing the significant climate change mitigation potential of coastal ecosystems, specifically mangroves, tidal marshes and seagrass meadows, in climate change mitigation (see Annex 1). Inclusion of coastal systems in climate change policy or financial mechanisms for climate mitigation will not be a priority until the broader policy community is aware of the strong scientific basis for Blue Carbon as a significant carbon sink and reservoir and a source of significant emissions when mismanaged and that there exist cost-effective management measures and solutions for the abatement of emissions.

✱ During COP 17 in Durban, SBSTA recognized the usefulness of assessing information on coastal and marine ecosystems and their role for climate change mitigation. SBSTA invited “Parties and regional and international research programmes and organizations active in climate change research, including marine research, to provide information on the technical and scientific aspects of emissions by sources, removals by sinks, and reservoirs of all greenhouse gases, including emissions and removals from coastal and marine ecosystems such as mangroves, tidal saltmarshes, wetlands and seagrass meadows, with a view to identifying and quantifying the impact of human activities”.

* Parties are requested to submit their views on specific themes to be addressed at the next research dialogue meeting in May 2012. The SBSTA dialogue on developments in research activities relevant to the needs of the Convention provides an opportunity to inform and exchange views on emerging scientific findings as well as research priorities and gaps. It is being held in conjunction with the SBSTA summer meetings to be held during the SBSTA 36 in May in Bonn, Germany. In particular, it is an opportunity to provide details of the scientific foundation for Blue Carbon.

Opportunities

* The next SBSTA research dialogue offers a significant opportunity to highlight emissions from sources and removals by sinks and reservoirs from coastal and marine ecosystems as part of research activities relevant to the needs of the Convention. The substance and certainty of the relevant science must also be communicated through available channels to the broader climate change policy community.

Recommended activities

Coastal Ecosystems	Recommended Activities	Targeted Date	Stakeholders
Mangroves Saltmarshes Seagrasses	* Submit information to SBSTA on the technical and scientific aspects of emissions by sources, removals by sinks, and reservoirs of all GHGs from coastal and marine ecosystems Got recommended to use one to one text from SBSTA docs	Before SBSTA 36 – May 2012	Regional and international research program & organizations
	* Request that emissions and removals of GHGs from coastal and marine ecosystems to be addressed as a specific theme at the next research dialogue	Submission by 5 March 2012	Parties
	Ensure natural valuation/ global economics reports such as TEEB include Blue Carbon section	Ongoing	NGOs UN agencies
	Highlight relevance of Blue Carbon activities for climate change mitigation at relevant climate change meetings, such as the UNFCCC COPs (e.g. through the Rio Convention pavilion, side-events and other events) and other climate change conferences	UNFCCC COP 18 (Nov/Dec 2012)	Parties NGOs UN agencies

6.1.3 Enhance the scientific and technical basis (data, reporting and accounting guidelines, methodologies, etc) for financing of coastal carbon management activities

Background

At its 33rd session in December 2010 in Cancun, the SBSTA invited the IPCC to prepare additional guidance on wetlands. In response to this invitation and an expert workshop in May 2011, the IPCC at its 33rd session in May 2011 in Abu Dhabi decided to produce the "2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands."

Chapter 4 of the supplement will focus on 'Coastal Wetlands'. This includes tidally influenced wetlands, specifically including, mangroves, saltmarshes, seagrasses and tidal freshwater systems. This supplement will contain national-level inventory methodological guidance, including default emission factor values, to fill the gaps identified in the 2006 IPCC Guidelines in the sub-categories of peatland rewetting and restoration as well as anthropogenic emissions and removals from additional coastal and freshwater wetland types.[9] The supplement will formalize the reporting methods that countries may apply to prepare comparable estimate of GHG fluxes and carbon stock changes from wetlands (including coastal ecosystems).

Mangroves and Saltmarshes

It is currently possible to quantify GHG emissions to the atmosphere resulting from degradation and removal of mangroves and saltmarshes. However, the existing 2006 IPCC Guidelines for National GHG Inventories do not provide specific guidance for the estimation and reporting of anthropogenic GHG emissions from and removals by mangroves or saltmarshes.[10] The 2013 IPCC supplement guidance on wetlands intends to address this omission. There are a number of other issues with the 2006 IPCC Guidelines for National GHG Inventories for national GHG accounting for wetlands that are particularly acute in coastal areas and will require additional attention. For example, the impact of sea-level rise on carbon sequestration rates and permanence is not addressed.[11]

Some technical challenges exist to developing IPCC guidelines for coastal wetlands including data availability and uncertainties in emissions factors.[12] Additional datasets, data collection programmes and data submission to the IPCC Emissions Factor Database (EFDB)[13] are required. Additional technical capacity is needed to generate required national information for inclusion into relevant UNFCCC reports and for accessing internationally MRV'ed financing.

To ensure compatibility and consistency, approaches already developed for tropical forests for emissions reductions within REDD+ should be used as a basis for further developing coastal carbon methodologies. Accounting for emission reductions requires an understanding of a number of elements: establishment of a reference level under business-as-usual conditions, displacement of emissions and the permanence of emissions reductions. The application of these principles to coastal areas needs additional attention. (These same issues will also need to be address in project-level activities under the voluntary carbon market (see 6.2).)

9 IPCC 33rd Session Abu Dhabi, 10-13 May 2011. Activities of the Task Force on National Greenhouse Gas Inventories. http://www.ipcc.ch/meetings/session33/doc07_p33_tfi_activities.pdf

10 IPCC Guidelines for GHG Inventories Volume 4 Agriculture. Forestry and other Land Use

11 Crooks, S. et al. 2011 Mitigating Climate Change through Restoration and Management of Coastal Wetlands and Near-shre marine Ecosystems. Challenges and Opportunities. Environment Department Paper 121, World Bank, Washington, DC, USA;

12 Murdiyarso, D. & Kauffman, J.B. 2011. Addressing climate change adaptation and mitigation in tropical wetland ecosystems of Indonesia. Center for International Forestry Research (CIFOR). Bogor, Indonesia.

13 http://www.ipcc-nggip.iges.or.jp/EFDB/main.php

Seagrasses

The existing 2006 IPCC Guidelines for National GHG Inventories for national GHG accounting do not include seagrasses.[14] The current absence of IPCC associated guidance on seagrasses prevents the accounting of relevant activities in national GHG Inventories as well as the development of carbon financing or other incentives for conservation of carbon in these ecosystems. However, the UNFCCC clearly refers to the role and importance of GHG sinks and reservoirs in coastal and marine ecosystems and sets a general obligation on all Parties to promote sustainable management, conservation and enhancement of sinks and reservoirs in coastal and marine ecosystems.[15]

The future inclusion of seagrasses into IPCC definitions and guidance would facilitate the development of incentives for seagrass management including conservation and restoration. Guidance from the IPCC is needed on how seagrasses should be addressed within the current AFOLU and LULUCF categories. Additional research to support the development of IPCC guidance and build scientific understanding of carbon storage and emissions from disturbed seagrass systems is required. Development of projects associated with emission reductions from seagrasses is currently challenging as emissions factors for these systems have not been satisfactorily established.

Opportunities

At SBSTA 35 Parties agreed that SBSTA may, at its 36th session (May 2012), consider the need for a workshop to give in-depth consideration to the themes considered in the research dialogue, amongst other on emissions and removals from coastal and marine ecosystems (see also 6.1.2).[16]

Parties could request a SBSTA workshop on coastal and marine ecosystems to support identification of human activities and mitigation actions and their impacts on the GHG balance of coastal and marine ecosystems under the SBSTA agenda item on research and systematic observation. The workshop could:

- Assess the carbon stored and the GHG balance of different coastal and marine ecosystems (with a focus on mangroves, saltmarshes, and seagrass) and assess anthropogenic drivers of loss and degradation and their impact on stored carbon and GHG balance.
- Identify needs for further action by the IPCC, SBSTA, SBI and/or COP, if any.
- Identify capacity building needs of developing countries in order to enhance national capacity to address technical and methodological issues related to research and observation of coastal and marine ecosystems.

14 IPCC Guidelines for GHG Inventories Volume 4 Agriculture. Forestry and other Land Use

15 UNFCCC Preamble and Art 4.1(d)

16 Research and systematic observation. Draft conclusions proposed by the Chair. FCCC/SBSTA/2011/L.27

Additional areas for scientific research include:

Data collection

- Significantly increasing the scientific data, observations and publications from developing countries, particularly those with significant mangrove, seagrass and salt marsh areas. Increased local capacity building will be necessary to achieve this.
- Mapping of converted and degraded coastal ecosystems and the quantification of emissions from exposed organic soils.
- Improved mapping of coastal ecosystem extent and carbon pool size, particularly saltmarshes and seagrass meadows.
- Improved quantification of carbon sequestration capacity of undisturbed, restored and managed tidal wetlands
- Quantification of other GHG emissions (e.g., increasing understanding of methane releases from saltmarshes and mangroves in environments under the threshold salinity level for methane production (i.e., 18[17])), and development of emissions factors.

Monitoring emissions, emissions reductions and removals

- Further research related to emission rates over time for a range of drivers of ecosystem degradation or loss (e.g., drainage, burning, harvesting or clearing of vegetation at different intensity levels).

The International Blue Carbon Science Working Group is currently developing a Best Practice Field Guide for Assessing and Estimating Coastal Wetland Carbon Stock, Sequestration Rates and Emissions Rates. The field guide is intended to support the IPCC Task Force updating the 2006 IPCC guidelines for wetlands as well as to guide standardized field data collection and support national and site level pilot project development.

Recommended activities

Coastal Ecosystems	Recommended Activities	Targeted Date	Stakeholders
Mangroves Saltmarshes Seagrasses	Agree to establish a technical and scientific workshop under the auspices of SBSTA to include GHG emissions and removals from coastal and marine ecosystems	SBSTA 36	Parties
Mangroves Saltmarshes Seagrasses	Improve scientific knowledge of carbon stocks, emissions and sequestration	ASAP	Blue Carbon Scientific Working Group Larger science community
Mangroves Saltmarshes Seagrasses	Ensure all relevant data is included in IPCC database and available for inclusion in IPCC guidelines Increase funding and research on essential coastal carbon issues (emission factors, etc.)	Literature cut-off dates: July 2012: IPCC 5AR; October 2012 IPCC suppl. guidelines	Blue Carbon Scientific Working Group Larger science community

17 Poffenbarger, H.J., Needelman, B.A., Megonigal, J.P. 2011. Salinity Influence on Methane Emissions from Tidal Marshes, Wetlands vol. 31(5) p. 831-842.

6.1.4 Access carbon finance through UNFCCC mechanisms and related funding streams

a. Include mangrove forests in relevant REDD+ activities

Background

In 2010, Parties to the UNFCCC at COP 16 recognized and encouraged developing countries to contribute to mitigation actions by the forest sector through REDD+ activities that (a) Reduce emissions from deforestation; (b) Reduce emissions from forest degradation; (c) Conserve forest carbon stocks; (d) Sustainably manage forests; and (e) Enhance forest carbon stocks.[18] REDD+ provides a framework for financing management activities that reduce emissions from mangrove deforestation and reduce emissions and enhance removals by activities related to the use of those systems. Several countries already include mangroves in their national REDD+ plans. For example, Costa Rica[19], Tanzania[20], Indonesia[21] and Ecuador[22] refer to mangroves under their national submissions to the UN-REDD programme and the Forest Carbon Partnership Facility (FCPF), although mostly limited in extent and detail.[23]

* REDD+ negotiations in Durban focused on technical issues such as safeguards, and forest reference emission levels and forest reference levels. A COP Decision was taken highlighting the possibility of a step-wise approach to national forest reference emission level and/or forest reference level development and also noting that significant carbon pools and/or activities should not be excluded.[24] The step-wise approach would allow Parties to improve their calculations of forest reference emission level and/or forest reference level over time by using new and better data, improved methodologies and information as they become available.

Currently, market-based and non-market-based approaches, such as joint mitigation and adaptation approaches for the integral and sustainable management of forests, are being discussed as financing avenues for REDD+ activities.[25]

18 UNFCCC Decision 1/CP.16 The Cancun Agreements: Outcome of the work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention paras 68-79.

19 FCPF – Costa Rica report

20 FCPF – Tanzania report

21 UN-REDD National programme Indonesia

22 UN-REDD National programme Ecuador

23 See for more detail Gordon et al. 2011 Financing Options for Blue Carbon: Opportunities and Lessons from the REDD+ Experience. Nicholas Institute for Environmental Policy Solution. Duke University.

24 Draft Decision [-/CP.17] Guidance on systems for providing information on how safeguards are addressed and respected and modalities relating to forest reference emission levels and forest reference levels as referred to in decision 1/CP.16

25 Draft decision [-/CP.17] Outcome of the work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention C. Policy approaches and positive incentives on issues relating to reducing emissions from deforestation and forest degradation in developing countries; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries

Opportunities

In order to ensure the full and comprehensive inclusion of mangrove forests under REDD+, mangrove specific activities must be integrated into national REDD+ strategies. This can include implementation of REDD+ decisions and identified REDD+ readiness activities such as improved mangrove carbon storage, sequestration and emissions data, identification of drivers of deforestation and degradation in mangroves. There is also a need to develop a monitoring system for collecting data and to ensure that reporting of estimates and information, consistent with UNFCCC decisions and IPCC methods, are capable of addressing also emissions and removals by mangrove ecosystems.[26] The Cancun Agreements call for the development of monitoring and reporting systems at the national level.

* SBSTA will continue to work on remaining technical issues in particular on how to address drivers of deforestation and forest degradation and on robust and transparent national forest monitoring systems, as well as on land tenure issues; forest governance issues and gender considerations.[27] Parties should include relevant mangrove related information, e.g. on the specific drivers of mangroves deforestation and degradation, the need to expand methodological approaches and the need to create national capacity for mangrove monitoring in their submissions.

Several national REDD+ strategies and readiness plans are being financed through current readiness funding from bilateral and multilateral development agencies and potentially through the future Green Climate Fund (GCF)[28]. Developing countries building national REDD+ strategies and readiness plans should include mangroves in those plans and bilateral and multilateral donors should support the inclusion of mangrove ecosystems in REDD+ readiness efforts.

Recommended activities

Coastal Ecosystems	Recommended Activities	Targeted Date	Stakeholders
Mangroves Saltmarshes Seagrasses	Identify and work with champion developing countries on explicitly including mangrove forests as part of a country's national REDD+ strategy *Possible champion countries include Ecuador, Cambodia, Vietnam, Indonesia, Mexico, PNG*	SBSTA 36	Parties
* Mangroves Saltmarshes Seagrasses	Include mangroves into step-wise approach towards the development of forest reference emission levels and forest reference levels and ensure the soil carbon pool is included where possible	ASAP	Blue Carbon Scientific Working Group Larger science community
* Mangroves Saltmarshes Seagrasses	Ensure input into SBSTA work on methodological guidance for mangrove activities related to REDD+ , e.g. specific drivers of deforestation and forest degradation	Literature cut-off dates: July 2012: IPCC 5AR; October 2012: IPCC suppl. guidelines	Blue Carbon Scientific Working Group Larger science community

26 Climate Focus. 2011. Blue Carbon Policy Options Assessment. Washington, DC, USA.

27 Methodological guidance for activities relating to 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. Draft conclusions proposed by the Chair. FCCC/SBSTA/2011/l.25.

28 Climate Focus. 2011. Blue Carbon Policy Options Assessment. Washington, DC, USA.

b. Develop NAMAs for coastal carbon ecosystems

Background

National Appropriate Mitigation Actions (NAMAs) can allow developing countries to develop and receive international financial support for nationally appropriate climate change mitigation actions.[29] Several countries have already submitted coastal wetland-related NAMAs (e.g. Sierra Leone, Eritrea and Ghana).[30]

Opportunities

Currently all activities aimed at mitigating climate change may qualify as NAMAs. This provides an opportunity for countries to tailor NAMAs to their specific needs and mitigation potential. Countries could use NAMA readiness activities to increase the understanding of the sink capacity of Blue Carbon ecosystems and of the emissions resulting from conversion and degradation of mangroves, saltmarshes and/or seagrasses, identify drivers of these emissions and activities needed to address those drivers. As the marine and conservation community has been looking at the drivers of coastal degradation for many years, possibilities for collaboration and lessons-learned between the climate change and marine community exist at local, country and regional levels and can be facilitated initially by the International Blue Carbon Policy and Science Working Groups and others who are interested.

Countries such as small island developing states that are not typically REDD+ countries, could use Blue Carbon related NAMAs to explore opportunities to access climate change mitigation finance for coastal management activities. For example, countries could explore the potential for a wetland NAMA, encompassing management of all relevant national wetland types.

- Developing country Parties who are yet to submit information on NAMAs have been encouraged to do so.[31] This could include intentions to develop Blue Carbon-based NAMAs. Additional workshops to further understanding of the diversity of mitigation actions will be held in 2012.
- Funding for readiness activities and implementation of NAMAs for coastal ecosystem management could be accessed through multilateral and bilateral initiatives that are currently providing fast-start finance.[32] However, is critical that Parties wishing to access GCF funds for Blue Carbon-based NAMAs in the future, describe this possibility now. “The Green Climate Fund (GCF) will support developing countries in pursuing project-based and programmatic approaches in accordance with climate change strategies and plans, such as 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”.
- It is expected that under the Durban Platform the contribution of natural carbon sinks and reservoirs to climate change mitigation, including coastal and marine ecosystems, will be comprehensively discussed and addressed within the NAMAs. This will likely be part of the working activities of 2013.

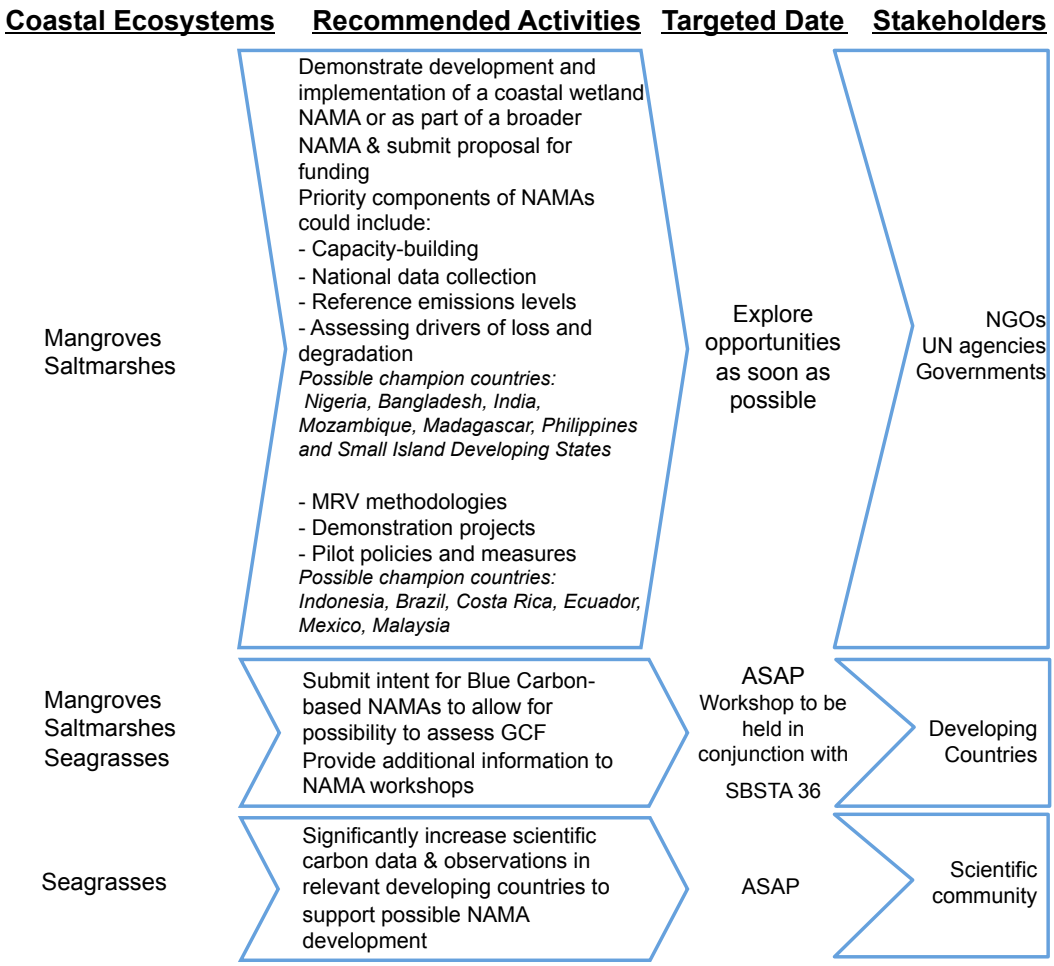
29 UNFCCC Decision 1/CP.16 The Cancun Agreements: Outcome of the work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention paras 48-67.

30 http://unfccc.int/resource/docs/2011/awglca14/eng/inf01.pdf

31 Draft decision [-/CP.17] Outcome of the work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention, B. Nationally appropriate mitigation actions by developing country Parties

32 Climate Focus. 2011. Blue Carbon Policy Options Assessment. Washington, DC, USA.

Recommended activities



c. Support improved management of Blue Carbon coastal systems through climate change adaptation financing

Accessing currently untapped climate change mitigation finance should be a priority for funding conservation and management of coastal Blue Carbon systems. Funding from climate change adaptation sources should be as well targeted as these systems provide numerous benefits for climate change adaptation, local livelihoods and biodiversity conservation, considering that adaptation funding may favour projects that have adaptation and mitigation value. Once the Green Climate Fund (GCF) will be operable, adaptation finance may increase in significance.

* Using different funds synergistically with Blue Carbon motives could help to protect and restore coastal carbon ecosystems.

6.1.5 Include Blue Carbon management activities as incentives for climate change mitigation by Annex-I Parties

Background

The role of Land-use, Land-use Change and Forestry (LULUCF) activities in the mitigation of climate change has been recognized within the UNFCCC. Mitigation achieved through activities in this sector, either by removing GHGs from the atmosphere or by reducing GHG emissions, can be used by Parties to the UNFCCC as part of their efforts to implement the Kyoto Protocol and contribute to the mitigation of climate change.

Several, but not all Annex-I Parties have agreed to a second commitment period of the Kyoto Protocol.[33] Some mangroves may qualify as forest under the Kyoto Protocol current definitions for LULUCF and must be accounted for by Annex I Parties under relevant activities of afforestation, reforestation, deforestation and forest management. "Rewetting and drainage of wetlands"[34] has been accepted as a new activity that may (but not must) be included in national accounting of LULUCF activities.[35] Emissions arising from the drainage of tidal saltmarshes for example, would be a qualified activity, so would the subsidence reversal by gradually raising water levels and building soil surfaces to intertidal elevation.

Other coastal restoration practices, such as the restoration or creation of tidal wetland by removing barriers or adding/removing fill and planting native plants could fall under the LULUCF category of "revegetation".[36] The restoration or creation of seagrass meadows by planting seeds or shoots could also fall under this category, as no land-restriction has been specified in the definition. However, additional guidance from technical and scientific bodies such as SBSTA or the IPCC on the inclusion of fully submerged systems into the GHG accounting process is needed.

Under the Kyoto Protocol industrialized countries can use the Clean Development Mechanism (CDM) to earn certified emission reductions (CERs) credits from emission-reduction projects in developing countries. CERs can be traded and sold to meet a part of emission reduction targets under the Kyoto Protocol. A site-level methodology for afforestation and reforestation of degraded mangrove habitats under the CDM was approved in 2011.[37]

33 Draft decision -/CMP.7 Outcome of the work of the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol at its sixteenth session

34 "Wetland drainage and rewetting is a system of practices for draining and rewetting on land with organic soil that covers a minimum area of 1 hectare. The activity applies to all lands that have been drained since 1990 and to all lands that have been rewetted since 1990 and that are not accounted for under any other activity as defined in this annex, where drainage is the direct human-induced lowering of the soil water table and rewetting is the direct human-induced partial or total reversal of drainage". Decision -/CMP.7, Land use, land-use change and forestry.

35 Decision -/CMP.7, Land use, land-use change and forestry

36 Revegetation is a direct human-induced activity to increase carbon stocks on sites through the establishment of vegetation that covers a minimum area of 0.05 hectares and does not meet the definitions of afforestation and reforestation contained here.

37 AR-AM0014: Afforestation and reforestation of degraded mangrove habitats http://cdm.unfccc.int/methodologies/DB/CKSXP498IACIQHXZPEVRJXQKZ3G5WQ

Opportunities

* SBSTA will continue substantial work under LULCUF in 2012,[38] developing procedures for possible additional LULUCF activities and alternative approaches for dealing with non-permanence under the CDM, exploring comprehensive accounting of anthropogenic emissions by sources and removals by sinks from LULUCF, and recommending procedures for applying the concept of additionality. Potential new LULUCF activities could include Blue Carbon related activities such as avoided wetland degradation through alternative use or prevention of disturbance. Similarly a more comprehensive accounting system under LULUCF should be encouraged to embrace conservation activities as well as ensure that the different drivers are appropriately managed so to minimize displacement of emissions.[39]

* Discussion and agreements on accounting rules made within the ongoing Kyoto Protocol negotiations are likely to influence other elements of the UNFCCC, such as for the outcomes of the Durban Platform (see 6.1.1). Furthermore, LULUCF discussion could provide a precedent for accounting of Blue Carbon systems by developing countries.

Recommended activities

Coastal Ecosystems	Recommended Activities	Targeted Date	Stakeholders
Mangroves	Ensure mangroves are included in Annex-I Party KP's accounting of forest activities	Reporting deadlines for Annex-I	Relevant Annex-I Parties (e.g. France and Australia)
* Saltmarshes	Account for 'Rewetting and Drainage' activities under Kyoto Protocol second commitment period	Reporting deadlines for Annex-I	Relevant Annex-I Parties
* Mangroves & Saltmarshes	Include other additional LULUCF activities regarding Blue Carbon ecosystems into SBSTA work program on LULUCF/CDM	CMP KP 9	Parties
* Mangroves & Saltmarshes	Ensure SBSTA work program to explore more comprehensive accounting of LULUCF activities considers the inclusion of conservation in the framework of mitigation activities and its operationalization in a land-based approach		Parties NGOs
* Mangroves & Saltmarshes	Address Blue Carbon-relevant issues in the SBSTA additionality work program		Parties NGOs

6.1.6 Monitor discussion on agriculture and its relevance for Blue Carbon

Background

Climate-Smart agriculture received significant attention in Durban, both within and outside official negotiations. Aquaculture and fisheries are issues closely link with those of land-based agriculture.

SBSTA has been requested to consider issues related to agriculture at its next session.[40]

Opportunities

Issues associated with aquaculture in coastal areas should be included in the broader agricultural discussions that will occur more formally within the UNFCCC. In particular, the impacts of agriculture and aquaculture, as drivers for loss and degradation of Blue Carbon ecosystems should be included in the discussions and included in submissions to the UNFCCC.

Recommended activities

Coastal Ecosystems	Recommended Activities	Targeted Date	Stakeholders
Mangroves Saltmarshes Seagrasses	Ensure discussion on agriculture and aquaculture take into account their role as drivers for deforestation, degradation and loss of coastal ecosystems	Ongoing	Parties NGOs UN agencies

40 Draft decision [-/CP.17] Outcome of the work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention. D. Cooperative sectoral approaches and sector-specific actions, in order to enhance the implementation of Article 4, paragraph 1(c), of the Convention

6.1.7 Support capacity-building activities to implement Blue Carbon activities

Background

Capacity-building is essential to enable developing country Parties to participate fully in addressing the challenges of climate change, and to implement effectively their commitments under the Convention. Capacity–building is an integral part of enhanced action on mitigation, adaptation, technology development and transfer, and access to financial resources. This need is particularly acute for implementing blue carbon activities, research and accounting as very few developing countries have the needed technical capacity.

Opportunities

Future decisions on capacity-building should include references to strengthen and coordinate efforts on scientific research and observation of all Blue Carbon ecosystems, particularly including seagrasses, and encourage cross-country activities and learning-experiences. Significant national capacity on Blue Carbon needs to be prioritized, particularly to increase the field measurements of coastal carbon globally and to ensure the carbon mitigation value is integrated into national policy addressing the impact of human activities on mangroves and wetlands.

Recommended activities

Coastal Ecosystems	Recommended Activities	Targeted Date	Stakeholders
Mangroves & Saltmarshes	Strengthen national capacity, with the view to improve data generation and the quality of national communication and GHG inventory on issues related to mangroves and wetlands	Ongoing – COP 18	Parties NGOs UN bodies
Seagrasses	Strengthen and coordinate efforts on scientific research and observation of seagrass meadows	Ongoing – COP 18	Parties NGOs UN bodies

6.2 Integrate Blue Carbon fully into other carbon finance mechanisms such as the voluntary carbon market as a mechanism for climate change mitigation

Background

A number of carbon market facilities that can potentially include Blue Carbon activities have been established outside the UNFCCC. Organizations like the Verified Carbon Standard (VCS) or the American Climate registry (ACR) are used by carbon mitigation projects globally to verify and issue carbon credits for the international voluntary offsets market. Other standards generating CO2-certificates include, the Climate, Community, and Biodiversity Standard, the CarbonFix Standard, Plan Vivo Systems and Standard.[41]

* The ACR has recently announced an open public comment period for a carbon offset methodology for deltaic wetland restoration that will quantify how wetland restoration work can combat climate change.[42]

The VCS is developing requirements for crediting wetlands conservation projects under the VCS program.[43] The VCS is expanding the scope for crediting wetlands projects to include mangroves, coastal wetlands and potentially other project types. The work will consider GHG related processes specific to different wetland ecosystems, availability of methods for carbon accounting, measurement and monitoring. A Draft VCS Wetlands Requirements is planned to be released in early 2012 for peer review, followed by public review. These requirements will provide guidance for project design and greenhouse gas accounting and procedures for validation and verification.

Opportunities

Carbon credit methodologies could be developed for Blue Carbon project implementation that meet carbon offset project requirements and address the following components of the accounting process: 1. Baseline and monitoring (stock, flux); 2. additionality; 3. permanence; and 4. quantifying leakage. A small number of draft methodologies are currently being developed but more efforts are needed to develop additional, comprehensive methodologies for pilot project(s). The private sector has started to play a role as driver for development methodologies and these avenues need to be further explored.

Additional funding, a coordinated approach, structured leadership and demand for carbon credits are needed for these efforts in the voluntary market to succeed.

41 Merger, E. & Williams, A. 2008. Comparison of Carbon Offset Standards for Climate Forestation Projects participating in the Voluntary Carbon Market. University of Canterbury, Christchurch, New Zealand. Published at: http://www.fore.canterbury.ac.nz/research/

42 http://www.americancarbonregistry.org/ACR%20Initiates%20Approval%20of%20Offset%20Methodology%20for%20Wetlands%20Restoration%20FINAL.pdf

43 http://www.v-c-s.org/node/287

Recommended activities

Coastal Ecosystems	Recommended Activities	Targeted Date	Stakeholders
Mangroves Saltmarshes	Continue to develop methodologies for mangrove and saltmarsh carbon management activities, including conservation	Ongoing	NGOs Scientific community Technical experts
Seagrasses	Develop first methodology for seagrass carbon management activities, including conservation	ASAP	NGOs Scientific community Technical experts
Mangroves Saltmarshes Seagrasses	Secure funding & identify interested stakeholders to develop methodologies, e.g. private sector Identify leadership by NGOs for coordination of implementation within different ecosystem types	ASAP	NGOs Private sector

6.3 Develop a network of demonstration projects

Field-based demonstration projects are urgently needed to: demonstrate the viability of Blue Carbon activities, including the science, policy and potential financing mechanisms; develop and refine methodologies; and build capacity in target countries.

Opportunities

Strategically designed and implemented Blue Carbon field projects will provide:

1. Demonstration of the climate change importance and viability of Blue Carbon projects to Governments, international bodies such as the UNFCCC, IPCC, and multinational agencies (such as the World Bank, the Global Environment Facility) necessary for the funding and implementation of Blue Carbon management and incentive mechanisms;

2. Venues for the development of practical, science-based methodologies and tools for UNFCCC and other frameworks that support carbon accounting for projects;

3. Demonstration and testing of methodologies recently developed for mangroves reforestation under the CDM and wetlands standards and requirements currently under development for the VCS;

4. Capacity building in Blue Carbon rich countries such as Indonesia, Brazil and the Philippines. A set of recommendations for prioritizing and developing demonstration projects will be developed by the International Blue Carbon Policy and Scientific Working Groups in 2012.

6.3.1 Develop a strategic approach for the coordination and funding of demonstration projects

Opportunities

Numerous stakeholders have started development of Blue Carbon projects at sites globally. To ensure maximum efficiency, knowledge transfer and international recognition of these projects, these projects must be coordinated and networked effectively. Further, funding must be strategically targeted at expanding the network of pilot project sites. Criteria for selecting priority sites for funding should include: demonstrating and testing a range of relevant activities in a range of geographic locations, ease of implementation (including political environment), implementation capacity, social and community acceptability, data and information availability, speed to carbon credit creation and potential for capacity building.

Recommended activities

Coastal Ecosystems	Recommended Activities	Targeted Date	Stakeholders
Mangroves Saltmarshes Seagrasses	Develop field based demonstration projects, including projects consistent with VCS and other relevant methodologies.	ASAP	NGOs Private sector Governments
	Enable strategic development and coordination of demonstration projects	ASAP	International Blue Carbon Working Group/ Other Int. coordination mechanism
	Secure funding for large scale demonstration project	ASAP	NGOs UN agencies Governments

6.3.2 Provide capacity building at local/national level

Opportunities

Effective implementation of Blue Carbon activities requires building national, regional, and local capacity. Implementing projects that include national coastal carbon assessments, national revisions and implementation of REDD+ strategies, development of coastal carbon NAMAs and on-the-ground Blue Carbon conservation, restoration and sustainable use projects in target countries provides a mechanism for this capacity building, including strengthening of appropriate institutions and coordination and communication between national agencies. Specific training is also needed for practitioners on carbon assessments, identification of priority conservation areas and restoration and sustainable use activities.

Best-practice guidance for field assessments currently under development by the International Blue Carbon Science Working Group will support the growing number of Blue Carbon measurement activities. The supplementary IPCC accounting guidelines on wetlands will help support national assessments activities.

Recommended activities

Coastal Ecosystems	Recommended Activities	Targeted Date	Stakeholders
Mangroves Saltmarshes Seagrasses	Disseminate relevant Blue Carbon information to governments, NGOs, coastal managers and other relevant stakeholders	ASAP	NGOs UN agencies
	Inform government representatives in a variety of sectors of the importance of Blue Carbon for climate mitigation to facilitate inclusion in land-use planning, economic planning, etc. Facilitate cooperation across ministries.	ASAP	NGOs UN agencies
	Provide training workshops on carbon accounting and conservation in coastal ecosystems	ASAP	NGOs UN agencies
	Support implementation of demonstration projects in targeted countries	ASAP	NGOs UN agencies

6.4 Integrate Blue Carbon into other international, regional and national frameworks and policies, including coastal and marine frameworks and policies

Several international ocean and coastal policy frameworks already make reference to the conservation, sustainable use, restoration of and reduced emissions from coastal ecosystems for climate change mitigation.[44] These policy frameworks raise overall recognition, improving management activities and provide some financial support for coastal Blue Carbon ecosystems management.

These policy frameworks include: the Convention on Biological Diversity (CBD), Ramsar Convention on Wetlands (Ramsar), UN Conference on Sustainable Development (Rio +20), United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea, UNEP Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA-Marine).

Chapter 6.4.4 describes a number of opportunities to integrate Blue Carbon into the activities of the European Union. Other regional ocean and coastal policy frameworks such as South Pacific Regional Environment Programme (SPREP) and Asia-Pacific Economic Cooperation (APEC) have not yet been discussed in detail.

6.4.1 Enhance implementation and inform financing processes of those relevant Multilateral Environmental Agreements (MEAs) that provide policy frameworks relevant for coastal and marine habitats management

The implementation of the commitments under a number of international Agreements such as the CBD and the Ramsar Convention, offer Parties immediate opportunities to meet the necessary efforts for coastal carbon management(see Annex 2). Funding mechanisms through these agreements should be fully explored and utilized.

a. Convention on Biological Diversity

Background

The Convention on Biological Diversity (CBD) has three main objectives: 1.The conservation of biological diversity; 2.The sustainable use of the components of biological diversity; 3.The fair and equitable sharing of the benefits arising out of the utilization of genetic resources. In 2010, the CBD in its decisions from COP10 in Nagoya invited Parties 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.[45]

Opportunities

Countries must now be encouraged and supported in implementing those decisions, including accessing funding through multilateral & bilateral processes supporting the CBD decisions (e.g. Global Environment Facility).

The CBD is currently in the process of assessing funding needs, gaps and priorities and identifying new and innovative funding mechanisms under its strategy for resource mobilization in support of the achievement of the Convention.[46] [47] This provides an opportunity for highlighting the importance of effective coastal management for mitigation and adaptation and the need for coastal Blue Carbon ecosystems to be considered in discussions and implementation of new and innovative sources of financing encouraged by the CBD.

The CBD is reviewing its programme of work on island biodiversity. This provides an opportunity to introduce relevant information regarding enhanced conservation, sustainable use and restoration of coastal ecosystems for climate change mitigation into coastal practices in island countries where coastal ecosystems including mangroves, wetlands and seagrasses are more likely to be relevant to the sustainable development opportunities of SIDS, food security, livelihoods, and vulnerability to impacts of climate change.

44 See Blue Carbon Policy Framework, version 1.0 http://data.iucn.org/dbtw-wpd/edocs/2011-058.pdf

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

46 Strategy for resource mobilization - http://www.cbd.int/financial/stragety/

47 COP 10 Decision X/3 Strategy for resource mobilization in support of the achievement of the Convention's three objec tives - http://www.cbd.int/decision/cop/?id=12269

b . Ramsar Convention on Wetlands

Background

The Ramsar Convention on Wetlands 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.[48] The Contracting Parties of the Ramsar Convention have adopted a number of Resolutions that have relevance to coastal carbon management and the Convention's Scientific and Technical Review Panel (STRP) is currently working on different tasks related to climate change mitigation and wetlands.

Opportunities

Parties could access funding to implement relevant Resolutions for coastal Blue Carbon conservation through multilateral & bilateral processes (e.g. GEF). Ramsar's Small Grant Programmes could also be an opportunity to support pilot projects in the ground.

Recommended activities

Coastal Ecosystems	Recommended Activities	Targeted Date	Stakeholders
Mangroves Saltmarshes Seagrasses	Support implementation of CBD and Ramsar decisions & commitments supporting Blue Carbon conservation including accessing funding available through multilateral and bilateral processes	Ongoing	UN agencies Governments
	Assess national level CBD & Ramsar commitments for coastal protection and evaluate activities needed to meet those commitments.	ASAP	NGOs UN agencies
	Inform CBD's strategy for resource mobilization	ASAP	NGOs
	Inform CBD's review on its program of work on island biodiversity on the role and importance of coastal ecosystem management for climate change mitigation	For COP 11	Int. Blue Carbon Policy Working Group NGOs Governments
	Ensure international funding agencies, e.g. GEF, ADB are informed on coastal carbon management opportunities for climate change mitigation	Ongoing	NGOs UN agencies

48 http://www.ramsar.org/cda/en/ramsar-about-mission/main/ramsar/1-36-53_4000_0__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6.4.2 Use existing international frameworks to advance and disseminate technical knowledge on coastal ecosystems management for climate change mitigation

Background

Existing international frameworks provide established mechanisms for advancing and disseminating knowledge on coastal ecosystems management for climate change mitigation. Further, coordinating capacity building and knowledge and best practices sharing should be coordinated in parallel with the development of a network of demonstration projects.

Opportunities

Opportunities for capacity building through existing frameworks include:

1. The CBD through its Clearing-House Mechanism[49] and capacity-building programs[50] provides venues to address the scientific and technical information needs of developing countries. Priority is given to issues identified by the countries themselves, such as assessing national capacities for implementing the Convention and improving access to new information technologies and expertise. The CBD has called for an expert workshop on the role of marine and coastal biodiversity and ecosystems in adaption to and mitigation of climate change impacts, with the goals of sharing experiences and providing guidance for planning and implementing ecosystem-based approaches to climate change mitigation and adaptation.

2. The Ramsar Convention's Scientific and Technical Review Panel (STRP) is a subsidiary body that that providesscientific and technical guidance to the Conference of the Parties, the Standing Committee, and the Ramsar Secretariat. Scientific experts, for example from the International Blue Carbon Science Working group, could be considered as observers to or nominated as a member of STRP.

3. STRP is working on producing a report on the carbon balance methods in wetlands Possible synergies with other efforts such as the ongoing work under the VCS need to be further coordinated.

4. The UNEP Global Program Action for the Protection of Marine Environment from Land-based Activities (GPA-Marine) aims at preventing the degradation of the marine environment from land-based activities by facilitating the realization of the duty of States to preserve and protect the marine environment.[51] GPA-Marine has so far not explicitly included recommendations for better management of coastal ecosystems for climate change mitigation.

* The 2012 Manila Declaration on Furthering the Implementation of GPA-Marine stresses the importance of marine and coastal ecosystems and biodiversity to the mitigation of and adaptation to climate change, by identifying and addressing the underlying drivers of marine and coastal ecosystem loss and destruction, and improving the sustainable management of coastal and marine areas.[52]

49 CHM - http://www.cbd.int/chm/intro/

50 CHM - http://www.cbd.int/chm/capacity.shtml

51 http://www.gpa.unep.org/

52 http://www.gpa.depiweb.org/

5. The Regular process for global reporting and assessment of the state of the marine environment, including socio economic aspects (Regular Process) has been launched by the United Nations General Assembly (UNGA).[53] This is a further venue for scientific information on the role of coastal ecosystems to be addressed.

6. The Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) is an interface between the scientific community and policy makers that aims to build capacity for and strengthen the use of science in policy making.[54] IPBES will bring information together and synthesize and analyze it for decision making in a range of policy fora such as the global environmental conventions and development policy dialogues. It seems important that this process integrates the role of conservation, sustainable use and restoration of coastal ecosystems for climate change mitigation, as well as adaptation, into its efforts.

7. The UN Oceans Atlas is an information system designed to familiarize policy makers with ocean issues and provide access to scientists, students and resource managers to underlying data bases and approaches to sustainability.[55] This Atlas could add 'mitigation' as a sub topic under its Climate Change theme.

Recommended activities

Coastal Ecosystems	Recommended Activities	Targeted Date	Stakeholders
Mangroves Saltmarshes Seagrasses	Inform and provide CBD with scientific and technical information for capacity-building	Ongoing, CBD EbA/EbM workshop	NGOs Scientists
	Explore opportunity for Blue Carbon exchange of expertise for RAMAR STRP	ASAP	NGOs RAMSAR
	Liaise between different technical reports and activities: Ramsar, VCS	ASAP	RAMSAR VCS
	Include relevant Blue Carbon knowledge (science, management activities, valuation, …) into related international processes - UNEP Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA-Marine). - Global Marine Assessment (GMA) - Intergovernmental science – policy platform on biodiversity and ecosystem services (IPBES) - UN Oceans Atlas	Ongoing	NGOs Governments UNEP MEAs

53 Regular Process - http://www.un.org/Depts/los/global_reporting/global_reporting.htm

54 IPBES website - http://ipbes.net/about-ipbes.html

55 UN Atlas - http://www.oceansatlas.org/

6.4.3 Use international frameworks to raise awareness of the role of conservation, restoration and sustainable use of coastal ecosystems for climate change mitigation

Background

Meetings and communications associated with international frameworks provide opportunities for building awareness and support for coastal carbon-based conservation and restoration. This can support implementation of the relevant parts of the frameworks themselves but also have influence on change within other frameworks such as the UNFCCC.

Opportunities

1. Conventions such as the Ramsar Convention already integrate the importance of adequate coastal ecosystem management for climate change mitigation and other benefits Climate change related activities of these Conventions should continue to highlight the role of conservation, sustainable use and restoration of coastal ecosystems for climate change mitigation in their resolutions or decisions.

2. At the 2012 UN Conference on Sustainable Development (Rio +20), many Small Island States will be focused on 'keeping the green economy blue'. This provides an opportunity to emphasise the role of effective coastal ecosystem management for climate change mitigation, as well as adaptation and its benefit for coastal communities in developing States. Rio +20 is also supporting a Pavilion at the CBD COP 11 to be held in India in October 2012, which provide venues to continue to raise awareness of the issue.

3. The IUCN World Conservation Congress in June 2012 provides a further venue for highlighting the role of coastal ecosystem management for climate change mitigation and for confirming the Union's engagement in this topic for its next quadrennial programme.

Recommended activities

Coastal Ecosystems	Recommended Activities	Targeted Date	Stakeholders
Mangroves Saltmarshes Seagrasses	Highlight role of coastal ecosystems for climate change mitigation through existing events such as the Rio Convention pavilion and other side-events at convention meetings, conferences and other relevant meetings	CBD COP 11 Rio+ 20	NGOs MEAs Governments
	Highlight role of coastal ecosystems for climate change mitigation in upcoming CBD and Ramsar meetings	CBD COP 11 - 2012 RAMSAR COP 11 2011	NGOs MEAs Governments
	Include role of coastal ecosystems for climate change into IUCN WCC outcomes	Deadline for submission of Motions: 8 May 2012	IUCN Secretariat and Members

6.4.4 Integrate coastal ecosystem conservation, sustainable use and restoration activities as a mechanism for climate change mitigation into relevant regional policy frameworks

This chapter describes a number of opportunities to integrate Blue Carbon into the activities of the European Union. Other regional ocean and coastal policy frameworks such as South Pacific Regional Environment Programme (SPREP) and Asia-Pacific Economic Cooperation (APEC) have not yet been discussed in detail yet.

Background

The EU has several strategies and initiatives whose goals could explicitly integrate coastal Blue Carbon ecosystem conservation, sustainable use and restoration activities; for example the EU Biodiversity Strategy to 2020 (including a restoration target of at least 15 % of degraded ecosystems, the planned Green Infrastructure Strategy, and the BEST initiative which aims to establish a voluntary scheme for Biodiversity and Ecosystem Services in Territories of European Overseas) and the Roadmap to a resource efficient Europe. Other relevant EU Instruments include the Nature Directives and the Marine Strategy Framework Directive, however, these are not described further in this document.

The EU Biodiversity Strategy states: "ecosystem-based approaches to climate change mitigation and adaptation can offer cost-effective alternatives to technological solutions, while delivering multiple benefits beyond biodiversity conservation" and be part of a more climate-resilient, low-carbon economy. "Nature-based innovation, and action to restore ecosystems and conserve biodiversity, can create new skills, jobs and business opportunities. TEEB estimates that global business opportunities from investing in biodiversity could be worth US$ 2-6 trillion by 2050".[56]

Within the EU Biodiversity Strategy, the objective of BEST is to promote conservation and sustainable use of biodiversity and ecosystem services, which includes ecosystem-based adaptation and mitigation in Europe's Outermost Regions and the European Overseas Countries and Territories.[57]

The vision of the Roadmap to a resource efficient Europe is that "by 2050 the EU's economy has grown in a way that respects resource constraints and planetary boundaries, thus contributing to global economic transformation. Our economy is competitive, inclusive and provides a high standard of living with much lower environmental impacts. All resources are sustainably managed, from raw materials to energy, water, air, land and soil. Climate change milestones have been reached, while biodiversity and the ecosystem services it underpins have been protected, valued and substantially restored".[58]

Opportunities

BEST constitutes an important contribution to the achievement of the global biodiversity target and provides practical examples for Green Infrastructure and valuation of ecosystem services. Through implementation of BEST in the EUs outermost regions and overseas countries and territories, the EU could lead global efforts to improve understanding of Blue Carbon scientific and management issues. Knowledge and lessons learned on coastal biodiversity and climate change issues can be shared through existing capacity-building processes e.g. in small islands developing states (SIDS).

Two of the selected projects submitted to the open call BEST-2011 are potentially relevant for Blue Carbon: CARIPES on ecosystem services provided by marine protected areas in the Caribbean and CORAIL on Coral reefs in a changing world – ecosystem services from coral reefs: public tools for decision making in New Caledonia and French Polynesia. In both instances, the potential for integrating the mitigation value of carbon ecosystems into the projects should be considered.

Through its Roadmap to a resource efficient Europe, the EU and its Member States are striving to remove barriers that hold back resource efficiency and so create the right set of incentives for production and consumption decisions. Including the real costs of resource use into the prices and subsidies (such as for example, the true carbon cost of shrimp farming in converted mangroves) could provide positive incentives for sustainable aquaculture practices and reduce pressure on mangrove clearance (see also 6.4.5 b).

56 http://ec.europa.eu/environment/nature/biodiversity/comm2006/pdf/2020/1_EN_ACT_part1_v7[1].pdf

57 http://ec.europa.eu/environment/nature/biodiversity/comm2006/2020.htm#best

58 http://ec.europa.eu/environment/resource_efficiency/pdf/com2011_571.pdf

Recommended activities

Coastal Ecosystems	Recommended Activities	Targeted Date	Stakeholders
Mangroves Saltmarshes Seagrasses	Ensure the Blue Carbon value is included in the implementation of relevant EU strategies, e.g. EU Biodiversity Strategy to 2020 and the Roadmap to a resource efficient Europe	Ongoing	EU NGOs
Mangroves Saltmarshes Seagrasses	Explore opportunities to include Blue Carbon activities into EU BEST initiative, e.g. on increased understanding of measuring, reporting and verification of carbon emission from Blue Carbon systems	Ongoing	EU NGOs

6.4.5 Integrate coastal ecosystem conservation, sustainable use and restoration activities as a mechanism for climate change mitigation into existing national, sub-national and sectoral policy framework

National, sub-national and sectoral policies provide essential frameworks for supporting and accelerating coastal ecosystem conservation, sustainable use and restoration activities, based on their mitigation value.

a. Include Blue Carbon activities into national and regional governance schemes

Background

National and regional governance of coastal areas is increasingly based on spatially-based planning approaches. Integrated Coastal Zone Management (ICZM) and Marine Spatial Planning (MSP) are planning processes, based on sound and shared knowledge, that take into account different human activities, terrestrial and marine, to identify and allocate different coastal and marine activity zones. MSP for example is "process of analyzing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic, and social objectives that usually have been specified through a political process".[59]

Marine Protected Areas (MPAs) refer to a wide range of options for the spatial management of human interactions with the marine environment. Management options include a range from strictly protected no-take reserves to areas in which multiple interactions with the marine environment are allowed, such as tourism and fisheries. MPAs are being established around the world as a tool to achieve objectives including the conservation of biodiversity and habitats, co-ordination of activities in multiple-use areas, maintenance of healthy ecosystems and the sustainable exploitation of marine living resources.[60]

Until now all these different approaches to coastal conservation have not explicitly addressed the carbon mitigation potential of Blue Carbon ecosystems. There is a significant opportunity to integrate carbon sink management into coastal zone planning. This will expand support for coastal zone management as well as ensure that greater practical measures are included within such schemes to fully protect vulnerable coastal ecosystems.

59 http://www.unesco-ioc-marinesp.be/marine_spatial_planning_msp

60 Toropova, C. et al. (eds.) 2010. Global Ocean Protection: Present Status and Future Possibilities. Brest, France: Agence des aires marines protégées, Gland, Switzerland, Washington, DC and New York, USA: IUCN WCPA, Cambridge, UK: UNEP-WCMC, Arlington, USA: TNC, Tokyo, Japan: UNU, New York, USA: WCS. 96pp.

Opportunities

ICZM policy: Integrate incentives to achieve better recognition and protection of blue carbon resources as part of spatial management plans. For example, incentives for watershed management that increases coastal water quality (e.g. Chesapeake Bay), or including Blue Carbon conservation as a key element in sustainable tourism operations.

MPA policy: Ensure Blue Carbon habitats are fully protected as part of MPA network development and management. Given their disproportionately important climate mitigation role and their highly threatened status, actions should be taken to ensure all intact Blue Carbon habitat is fully protected. Rehabilitation objectives should be introduced to restore degraded blue carbon habitats when present rather than exclude them from MPA network consideration

Economic analysis is needed to support the implementation of Blue Carbon into marine spatial planning and related policy, especially consider the viability of different incentives for protection and sustainable use of Blue Carbon habitats. Currently, the costs of implementation of effective integrated coastal planning are often funded through environmental grants (both government and private) and is not supported by the value of the ecosystems. Similarly, the continued management and operation costs often have non-continuous sources of funding. In some cases, funding for either the initial implementation costs and/or the continued operation costs of a coastal management scheme could be supported by the carbon value of coastal systems. However, the economic viability of such approaches needs investigation. Accordingly additional areas for economic analysis have been identified as:

- Understanding the cost of Marine Spatial Planning vs the opportunities that the carbon value of Blue Carbon ecosystems –socially, economically, environmentally, institutionally;
- Can Blue Carbon help reverse the trend in inequitable distribution of coastal ongoing in many areas? By incentivizing the protection and management of Blue Carbon habitats within the local community, would previously difficult to achieve inward investment and alter the drift of benefits away from the community?
- Can Blue Barbon provide sufficient funding to be significant in allowing the transition to coastal management? Does the presence of carbon significantly change the investment opportunity to greatly expand the protection, conservation and wise use of Blue Carbon habitats;

Coastal Blue Carbon ecosystems are highly vulnerable to the impacts of human activities in the upstream watershed, e.g. sedimentation, agricultural runoff etc. Policy schemes such as ICZM as well as other sectoral policies (e.g. agricultural policies), should reflect relevant watershed management activities and regulations.

Recommended activities

Coastal Ecosystems	Recommended Activities	Targeted Date	Stakeholders
Mangroves Saltmarshes Seagrasses	Include the Blue Carbon value of coastal ecosystems into national and regional coastal and marine planning processes (ICZM, MPS, MPAs)	Ongoing	Governments Local authorities NGOs
Mangroves Saltmarshes Seagrasses	Include Blue Carbon ecosystems into watershed relevant policies, e.g. agricultural policies, flood control	Ongoing	Governments Local authorities NGOs

b. Encourage private sector engagement

Background

Private sector activities result in many of the impacts causing loss and degradation of Blue Carbon ecosystems (for example, fish and shrimp production in converted mangroves, coastal development, agricultural conversion of saltmarshes.) Blue Carbon provides new opportunities to engage the private sector and address many of these impacts, as the significant carbon emissions associated with these ecosystems has strong resonance with industry.

Opportunities

A number of industries may already be inherently aligned with policies emphasizing conservation, restoration and sustainable management of coastal ecosystems. For example, in some locations, the insurance industry already recognizes the value of coastal habitats as protection against storm damage, sea level rise and flooding risk. Thus new ways of working could be developed to reduce insurance risk and halt the decline in such coastal habitats, whilst boosting their carbon potential through effective management. The tourism industry is also dependant on healthy coastal ecosystems and development of standards and certifications based on coastal carbon are likely to be possible.

Other opportunities are based on the relative benefit (both economic and non-financial) of coastal carbon relative to the benefits of the activities driving loss and degradation of blue carbon ecosystems. For example, are small scale shrimp farms on converted mangroves, economically favorable in comparison to new long-term (25 year) carbon-based investments in the local community and habitat protection? Can the relatively very large carbon impact of shrimp farms in converted mangroves result in broader consumer-driven change of practice? For example, EU-wide sustainable sourcing policies could strongly disfavor shrimp from converted mangroves and can harmful and un-sustainable subsidies for these activities be removed?

The carbon cost of products from coastal ecosystems should be integrated into current consumer transparency programs for related products. For instance, opportunities exist to integrate coastal carbon impacts into sustainable seafood cards a number of organizations are providing to the public.

Analysis that would support constructive engagement with the private sector include: analysis of the relative carbon emissions associated with aquaculture and agriculture in coastal ecosystems compared to other uses of these ecosystems and to other sources of carbon emissions; and a value chain analysis of shrimp.

Recommended activities

Coastal Ecosystems	Recommended Activities	Targeted Date	Stakeholders
Mangroves Saltmarshes Seagrasses	Identify and implement opportunities to build Blue Carbon awareness and strategies into insurance industry operations	Commence 2012	Insurance Industry Governments NGOs
	Factor in the true carbon cost of Blue Carbon associated fisheries and aquaculture identifying sustainable operations and taking action on carbon unfriendly activities	Commence 2012	Aquaculture Industry EU Governments NGOs
	Ensure that the true costs of Blue Carbon are included in fisheries consumer choice cards	2012 onwards	NGOs

6.5 Facilitate the inclusion of the carbon value of coastal ecosystems in the accounting of ecosystem services

The International Blue Carbon Policy Working Group identified the inclusion of the carbon value of coastal ecosystems in an integrated accounting of ecosystem services as an overarching Blue Carbon Policy Objective. Detailed discussion was, however, not feasible at this meeting.

Additional efforts should consider how to best include the carbon value of coastal ecosystems in the accounting and payment of other ecosystem services, especially in light of the multiple ecosystem services each of these coastal ecosystems provides:

Ecosystem Services in Coastal Ecosystems

	Carbon	Shoreline Protection	Fish Nursery Habitat	Biodiversity	Water Quality
Mangroves	Store carbon in aboveground tree biomass as well in belowground roots and soils	Absorb and wave and wind energy; reduce erosion and storm surges; accrete sediment for adaptation to sea level rise	Form part of a network nursery habitats, refugia, and feeding grounds for many tropical fish species and invertebrates (e.g., shrimp, crabs and bivalves)	Maintain important and high land (e.g., birds and mammals) , coastal (invertebrates and fish), and ocean (e.g., coral reefs as part of the complex of tropical ecosystems) biodiversity	Filter pollution and waste (solid and dissolved), treat excess nutrients (e.g., nitrogen and phosphorus from land) and trap sediments
Saltmarshes	Store carbon in belowground root matrix and soil	Absorb wave energy	Serve as nursery habitats, refugia, and feeding grounds for many fish species	Sustain filter-feeding invertebrate species and particularly the endangered dugong	Filter sediment from water column and reduce turbidity; act as water quality indicator due to sensitivity to excess nutrients
Seagrasses	Store carbon in belowground root system and soils	Absorb wave energy; accrete sediment for adaptation to sea level rise	Serve as nursery habitats for fish, shellfish, and crustaceans	Provide feeding grounds for migratory birds and waterfowl and home to invertebrate species	Treat and filter excess nutrients (e.g., nitrogen and phosphorus from land); retain sediments

Existing carbon management strategies and standards, such as REDD+ and the Climate Change and Biodiversity Project Design Standards, already include consideration of other ecosystem services in carbon projects. Another option would be to include carbon in emerging conservation and financing incentives for protecting ecosystem services in general. It would be interesting to explore how they can be adopted for the blue carbon settings.

Potential Opportunities for Bundling and Stacking of Ecosystem Services in Coastal Ecosystems

Shoreline Protection	Fish Nursery Habitat	Biodiversity	Water Quality
Develop co-investment partnerships with municipalities, urban planners, protected area managers, disaster and climate change management agencies and insurance industry to help support initial carbon project development as part of shoreline protection strategies	Work with fisheries resource management agencies, commercial fishing industry, fishing cooperatives to develop co-management plans to protect mangroves and seagrass beds for both carbon and fish nursery functions; work with certification schemes to include carbon accounting as a certification criterion	Work with protected area managers and international biodiversity organizations to couple carbon payments with biodiversity management financing, particularly for endangered species; include carbon accounting in biodiversity offsets design; evaluate applicability of Climate Change and Biodiversity Project Design Standards and REDD+ criteria	Work with farmers to decrease nutrient and sediment runoff, particularly looking at potential synergies with the agriculture soil carbon consortium; work with coastal area businesses and communities to assess possibility of developing payment for watershed services schemes to improve water quality, biodiversity outcomes, and cultural and aesthetic values

In the development of strategies to stack and bundle carbon payments with payments for the other ecosystem services, it will be important to assess how other payments will impact considerations of additionality and leakage under the current carbon accounting framework and vice versa.

Annex 1 List of recent scientific articles

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Annex 2 Workshop Participants[1]

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Bucki, Michael – Directorate General for Climate Action, European Commission
Ching, Carolyn – Verified Carbon Standard
Crooks, Steve – ESA-PWA
Emmett-Mattox, Steve – Restore America's Estuaries
Federici, Sandro – Expert in national GHG inventories
Finlayson, Max – Charles Stuart University, Albury, NSW, Australia;
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Herr, Dorothée – IUCN
Kauffman, Boone – Oregon State University, Dept. of Fisheries and Wildlife
Kentarchos, Anastasios – Directorate General for Research, European Commission
Laffoley, Dan – IUCN - WCPA
Lau, Winnie – MARES/Forest Trend
Murray, Brian – Nicholas Institute, Duke University
Niesten, Eduard – Conservation International
O'Sullivan, Robert – Climate Focus
Palasi, Jean-Philippe – Conservation International, Brussels
Pidgeon, Emily – Conservation International
Reyes, Eduardo – CfRN
Roncerel, Annie
Sayer, Matthew –Economic assessment of climate policies, DG Climate for Action
Telszewski, Maciej – UNESCO-IOC
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Trines, Eveline – Silvestrum
Ulate, Ricardo– Conservation International, Costa Rica
Ullman, Roger – Linden Trust
von Unger, Moritz – Climate Focus
Zaunberger, Karin – Directorate General for Environment, European Commission

1 Not all participants attended the full workshop.

Linden Trust *for* Conservation

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