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***Blue Carbon – Opportunities for the
Regional Seas Conventions and Action Plans***

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Blue Carbon Policy Review of the Regional Seas

Synopsis

'Blue carbon' ecosystems (mangroves, salt marshes and seagrass) function as efficient carbon sinks, storing vast quantities of organic carbon and providing a range of services that sustain communities as well as business sectors and support their climate change adaptation. It is clear that the provision of climate change related ecosystem services by these systems is highly amenable to management intervention and restoration, and potentially provides many countries with cost-effective adaptation and mitigation strategies.

A 2012 overview of blue carbon emissions from converted and degraded coastal wetlands, places the total global emissions at 0.15 – 1.02 billion tons released annually. These emissions are equivalent to 3 – 19% from deforestation globally. However, mangroves, salt marshes and seagrass beds continue to decline at global annual loss rates of 1-2%, exceeding the rates of loss of most terrestrial ecosystems. This is of considerable concern in view of the erosion of ecosystem services.

At the international level, policy analysis and development of incentives for sustainable management of blue carbon ecosystems has focused predominantly on UNFCCC, including potential opportunities provided through compliance markets and REDD+ as well as the voluntary carbon market. However, comparatively little attention has been paid to regional frameworks for environmental priority setting and implementation of policies.

Regional reviews of institutional, legal and policy frameworks for the Regional Seas that relate to protecting and utilizing the adaptation and mitigation services provided by blue carbon ecosystems are proposed. Implemented through UNEP's Blue Carbon Initiative and Regional Seas programmes, the reviews would provide an opportunity to assess relevance of and possible shortcomings in existing frameworks and management initiatives, compiling a consistent information base across the world, identifying critical knowledge gaps and providing recommendations with respect to policy development and harmonization.

Recommendations

The Regional Seas are requested to consider the proposed assessments and to provide comments and input on the approach and methodology to ensure they are practicable and yield outputs that are relevant to the regions.

UNEP will work with Regional Seas to develop a suitable format for regional assessment/desk review during 2013.

UNEP and the Regional Seas will work together in identifying resources for conducting regional assessments, as well as on conduct the reviews starting 2013. UNEP will, through its Blue Carbon Initiative, venture to provide technical and, as possible, modest financial support to conducting the assessment in a limited number of regions.

Coastal ecosystem-based adaptation and mitigation

1. Coastal ecosystems provide a range of valuable ecosystem services, including food security, economic benefits and development opportunities. Mangroves, seagrass beds and saltmarshes can also provide climate change adaptation and mitigation opportunities. Well managed and healthy coastal ecosystems are valuable in helping coastal communities adapt to climate change threats e.g. by acting as buffers to rising sea level, shoreline erosion and extreme weather events. This provides a cost-effective alternative or complement to hard engineering adaptation options. Using ecosystems instead of or in conjunction with hard engineering options can have multiple benefits from ecosystem services.
2. Mangroves, seagrass beds and salt marshes are among the most carbon rich systems on the planet. They sequester atmospheric CO₂ through primary production and then deposit

in organic sediments. The rates of carbon sequestration per unit area are often higher than in carbon-rich terrestrial ecosystems such as tropical rainforests or peatlands. Unlike most terrestrial forests, which reach soil carbon equilibrium within decades, deposition of carbon dioxide in coastal ecosystem sediments can continue over millennia. Mangroves, salt marshes and seagrass beds thus have larger per unit area carbon deposits in organic sediments than most other ecosystems.

3. When degradation or conversion of blue carbon ecosystems result in oxidization of biomass and organic soil, these systems become significant sources of carbon dioxide. The rate of emissions is particularly high in the decade immediately after disturbance, but continues as long as oxidation of biomass and sediment occurs, releasing in a relatively short period carbon dioxide sequestered over hundreds to thousands of years.

Current status and trends of coastal blue carbon ecosystems

1. The total mangroves area was estimated to be 137,760 km² in 2000. More than half of the world's original mangrove forest has disappeared. Conversion for shrimp and fish aquaculture accounted for between 20 and 50% of the total lost mangrove area worldwide in the decades leading up to the turn of the millennium. Over-exploitation of wood products, urbanization, and diversion of fresh water flow are other major drivers or degradation. The annual global rate of mangrove loss is presently between 1 and 2%.
2. There is no detailed and consistent global inventory of salt marshes, and global area estimates made vary by an order of magnitude. Saltmarshes are at risk of degradation and loss from a variety of human activities including reclamation of land for agriculture, building of dikes, nitrogen loading from land-based activities, sewage, urban and agricultural run-off, and industrial wastes. Globally, 25-50% of all tidal marsh area is estimated to have been lost due to human activity. The current annual rate of loss is estimated to be 1-2%. However, the most pervasive threat to the remaining area of salt marsh is probably accelerated sea level rise.
3. Seagrass meadows are found on every continent except Antarctica, with a global area estimated to exceed 177,000 km². This is a reduction of 30% in the last 100 years, and the rate of loss is estimated to have increased by an order of magnitude in the past 40 years. The main global drivers of this change are sediment loading and eutrophication, largely anthropogenic in origin.
4. A 2012 overview of our knowledge of blue carbon emissions from converted and degraded coastal wetlands, places the total global emissions at 0.15 – 1.02 billion tons released annually. These emissions are equivalent to 3 – 19% from deforestation globally.

The international policy framework and blue carbon

1. Under UNFCCC parties commit to sustainable management, conservation and enhancement of sinks and reservoirs in natural systems. UNFCCC explicitly recognizes the role and importance in marine ecosystems sinks and reservoirs. SBSTA provides information and advice on scientific and technological matters relevant to the convention, including on the role of afforestation, reforestation, avoided deforestation and forest degradation in climate change mitigation. It has been recognized by parties and observers that, while the bodies of the UNFCCC have developed strategies and mechanisms to enhance terrestrial carbon sinks, less attention has been given to marine and coastal ecosystems. Following the 35th session of SBSTA, parties and organizations have made submissions to enhance the dialogue on coastal marine ecosystems.
2. In 2011 the CDM board approved a baseline and monitoring methodology for afforestation and reforestation of degraded mangrove habitats¹, but while this methodology includes a soil component it does not apply to avoided emissions (voluntary carbon market methodology for coastal wetlands is also being developed under the

¹ AR-AM0014; see Annex 1.

Verified Carbon Standard). Through the IPCC, new guidance on estimating anthropogenic emissions and removals from wetlands and organic soils is under preparation. The first order draft of the “2013 Supplement to the IPCC Guidelines on National Greenhouse Gas Inventories: Wetlands” underwent expert review in 2012. The IPCC Fifth Assessment Report is also underway, with publication of Working Group reports and Synthesis Report between September 2013 and October 2014.

3. The CBD cross cutting issue on biodiversity and climate change was included in the work under the Convention in 2004 through decision VII/15. At its seventh meeting, the COP encouraged parties to take measures to manage ecosystems so as to maintain their resilience to extreme climate events and to help mitigate and adapt to climate change. An in-depth review conducted by the CBD based on submissions by parties and other information revealed that the links between biodiversity and climate change are well recognized but that parties face a number of obstacles especially when considering climate change mitigation.
4. CBD COP decision X/33 invites Parties to address the impacts of climate change on biodiversity, ecosystem services and biodiversity-based livelihoods, implement ecosystem-based approaches for adaptation and mitigation, and enhance the benefits for, and avoid negative impacts on, biodiversity from 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.
5. “The Future We Want”², the Rio+20 outcome document, recognizes that oceans, seas and coastal areas form an integrated and essential component of the Earth’s ecosystem. Of particular relevance to blue carbon are paragraphs 25 underscoring that combatting climate change requires urgent and ambitious action; 71 which encourages existing and new Green Economy partnerships; 97, which acknowledges the regional dimension of sustainable development; and 100, which welcomes regional and cross-regional initiatives.

UNEP and Regional Seas roles and mandates relevant to blue carbon

1. UNEP’s Blue Carbon Initiative aims to develop a global partnership to advance the sound management of coastal and marine ecosystems in order to ensure that their carbon sequestration and storage functions and other critical ecosystem services are maintained, and emissions of greenhouse gases are avoided. Key elements are: developing methodologies for carbon accounting and economic valuation of ecosystem services in coastal blue carbon ecosystems; using these methodologies in a range of small-scale interventions; filling gaps in our knowledge of ecosystem services and of carbon fluxes in blue carbon ecosystems; and exploring how incentives for protecting ecosystem services (including carbon benefits), and adoption and application of methodologies can be incorporated in policy frameworks.
2. The UNEP GEF project “Standardized methodologies for carbon accounting and ecosystem services valuation of Blue Forests” was approved by GEF Council in 2011 and is currently in the project preparation phase. This 4 year project under the International Waters stream will begin in 2013, with GEF funding of USD 4.5 million.
3. The Regional Seas were established as action oriented and inter-sectoral approaches to addressing marine and coastal environmental issues, promotion of the implementation of global MEAs, assessment of environmental status as well as drivers, and coordination of activities for the protection and development of marine and coastal resources. Few Regional Seas have engaged in development and implementation of comprehensive mitigation policy on a regional level. However, most support participating countries in efforts to meet biodiversity related, adaptation and mitigation responsibilities as agreed in international processes.
4. The Regional Seas directly address the management and sustainable use of mangroves, seagrass beds and salt marshes through action plans, relevant protocols

² <http://www.unccd2012.org/thefuturewewant.html>

including on Land Based Activities, ICZM, SPAW etc. Programmes of work may also provide specific actions with respect to these ecosystems. There is a long history of collaboration between and among the Regional Seas and UNEP on these issues.

5. Climate change vulnerability and adaptation have over the past decades emerged as an overarching priority in most Regional Seas. The ninth meeting of the regional seas agreed, inter alia, to assess and address the impact of climate change on the marine and coastal environment, and to promote cooperation for formulating regional adaptation strategies; and also recognized the need for economic valuation of marine and coastal ecosystem services for decision making and policy formulation.

Current blue carbon science, management and policy action

1. Since the publication by UNEP of the report 'Blue Carbon' in 2009, considerable progress has been made in reviewing and strengthening the science of mangrove, seagrass bed and salt marsh carbon, identifying research needs, mapping the policy landscape and identifying opportunities for and obstacles to financing blue carbon ecosystem management through compliance and voluntary carbon markets and other mechanisms. This is reflected in reports by, among others, UNEP, IUCN, the World Bank, FAO, Duke University, Climate Focus, and WWF. International Blue Carbon Scientific and Policy Working Groups have been established through the IOC of UNESCO, IUCN, and Conservation International. UNEP has also overseen and edited a special issue of the journal Ocean and Coastal Management focusing on coastal blue carbon, published in 2012.
2. The Blue Carbon Policy Options Assessment prepared by Climatefocus 2011 primarily addresses policy options and opportunities under the international climate change policy framework, including development of appropriate IPCC reporting guidelines, incorporating blue carbon into NAMAs, utilizing REDD+, and leveraging carbon financing. The 2012 Blue Carbon Policy Framework prepared through the International Blue Carbon Policy Working Group hosted by IUCN and CI 2012 focuses on five objectives including developing a network of demonstration projects, recognition and integration of blue carbon as a mitigation activity under UNFCCC, other carbon finance mechanisms and facilitating inclusion of the carbon value of coastal ecosystems in the accounting of ecosystem services.
3. A notable shortcoming in these efforts is the scant consideration given to the roles, functions and potential of regional institutions, legal and policy frameworks concerned with the management and development of the coastal environment in supporting quantification of ecosystem services (e.g. related to climate change adaptation and mitigation); management approaches that can sustain and enhance such services and enable financial transactions for service provision and use; and development of related methodology that is globally coherent and also sensitive to regional needs.
4. Conversely, the importance of coastal ecosystems for coastal adaptation and the role of their carbon dioxide reservoirs in the global greenhouse gas cycle are neither recognized explicitly, nor in a consistent manner in national and regional environmental policies. It is thus not fully understood whether and to what extent national and regional policies provide relevant and appropriate direction and incentives for protection, use and restoration of coastal ecosystems for the purpose of mitigation and adaptation.
5. Further and more detailed analysis of relevant institutional, legal and policy frameworks and activities under these can generate recommendations regarding gaps and opportunities for management and management finance that recognize and enhance the role of coastal ecosystems in climate change mitigation and adaptation, development of policy and institutional frameworks to protect these critical ecosystem services, and related research as may be needed.

Blue Carbon policy assessment approach

1. Regional institutional, legal and policy assessments of the relevance of and possible shortcomings in existing frameworks and management initiatives with regards to mitigation, adaptation and related ecosystem services provided by coastal blue carbon ecosystems is proposed. Carried out by and through UNEP and the Regional Seas, the assessments would provide a means to fill critical knowledge gaps and identify policy and management development priorities, as well as identify entry points for the Regional Seas to further blue carbon work in the regions.
2. The assessments could, inter alia, map regional and, insofar as it is possible or needed, national institutional, legal and policy frameworks relevant to managing coastal ecosystems for climate change related ecosystem service provisioning; identify whether and to what extent there is scope under the legal regime of the Regional Seas to initiate or further step up blue carbon related work; identify opportunities and constraints for public financing, market-based or other incentive schemes to support effective management; synthesize ongoing research, conservation and management initiatives of relevance in this regard; and elucidate recommendations for coherent and practical follow up action at the regional level. The approach can draw upon previous thematic studies and assessments carried out through the Regional Seas, such as the Marine Litter legal and institutional assessments conducted between 2005 and 2009, resulting in regional action plans³.
3. The assessments would yield detailed regional reports, reviewing institutional, legal and policy frameworks, identifying region-specific policy priorities, highlighting similarities and dissimilarities as well as opportunities for policy harmonization as may be needed to strengthen the management of coastal ecosystems for the purposes of mitigation, adaptation and other ecosystem service provision. The studies would also serve to identify practical opportunities for implementing coastal nature-based climate change mitigation and adaptation in the Regional Seas, potentially providing the foundation for a common blue carbon strategy.
4. The assessments would further encourage inter-regional exchange, e.g. of approaches for addressing shared issues and challenges, developing policy responses and programmes, and strengthening capacity building. Regional and inter-regionally linked networks or groups of experts on blue carbon ecosystems would also be convened based on existing networks in the regions.
5. In doing so the assessment would also support implementation and outcomes of UNEP's blue carbon initiative including the GEF "Blue Forest" project and its component 2 on application of methodology; component 3 on filling gaps in knowledge; and component 4 on exploration of adoption of methodologies by the international community, communication, consultation and outreach.

Recommendations

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 2. UNEP will work with Regional Seas to develop a suitable format for regional assessment/desk review during 2013.
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