



CLIMATE FOCUS

Blue Carbon  
Policy Options  
Assessment



Blue Carbon  
Policy Options Assessment

15 June 2011

The Linden Trust for Conservation

Version 4.0

Climate Focus  
1025 Connecticut Avenue, NW  
Suite 1102  
Washington, DC 20036

---



# Content

1.	Introduction	4
2.	Summary of Key Findings and Recommendations	6
2.1.	Priority Recommendations	6
2.2.	Overview of key findings	7
3.	IPCC reporting guidelines	9
3.1.	Key Findings	9
3.2.	IPCC guidance	10
4.	Incentives for blue carbon mitigation under the Kyoto Protocol	13
4.1.	Key Findings	13
4.2.	Annex I Accounting under the Kyoto Protocol	14
4.3.	Joint Implementation (JI)	17
4.4.	Clean Development Mechanism (CDM)	18
5.	Incentives for blue carbon mitigation under the UNFCCC	21
5.1.	Key Findings	21
5.2.	Nationally Appropriate Mitigation Actions	21
5.3.	Reduced Emissions from Deforestation and Forest Degradation (REDD+)	28
6.	Options for blue carbon under regional and domestic trading schemes	31
6.1.	Key Findings	32
6.2.	Australia	32
6.3.	European Union	35
6.4.	California	37
7.	Options for blue carbon under voluntary standards	39
7.1.	Key Findings	40
7.2.	Verified Carbon Standard (VCS)	40
8.	Other Relevant Areas	41
8.1.	Key Findings	41
8.2.	Fast-start Finance and Other International Support	41
8.3.	Adaptation	44
	Annex I: Status and development of NAMAs in relevant countries	46
	Annex II: Fast-start finance and channelling institutions	54



# 1. Introduction

Marine and coastal ecosystems, such as mangroves, salt marshes, and sea grasses,<sup>1</sup> store large amounts of carbon<sup>2</sup>, often referred to as “blue carbon”.<sup>3</sup> These types of ecosystems and vegetation may have an annual mitigation potential in the range of 300 to 900 Mt CO<sub>2</sub>e.<sup>4</sup> This is equivalent to 7-20% of the annual emissions from global deforestation and forest degradation,<sup>5</sup> despite blue carbon ecosystems only covering 1-2% of the total area of forest ecosystems.<sup>6</sup> Unlike terrestrial forests in which a higher percentage of carbon is found in above-ground biomass, in coastal habitats, the largest carbon pool is found in the soil; about 95-99% of the total carbon stock for salt marshes and sea grasses, and 50-90% for mangroves.<sup>7</sup> Mangroves in particular are among the most carbon-rich vegetation forms, and may store approximately 3,750 tCO<sub>2</sub>e per hectare on average, with organic-rich soils ranging from 0.5 to over 3 meters.<sup>8</sup>

In addition to their role as a global carbon sink, these coastal and marine ecosystems also provide key environmental services, such as preventing shoreline erosion, purifying water, and serving as an important fishery habitat, amongst others. As cities expand and coastal populations grow however, these environmental services and the ecosystems that provide them are under increased stress from urban development and agricultural expansion. The rate of loss of these ecosystems is unclear, but rough estimates calculate that between 0.7% and 2% are lost each year.<sup>9</sup> Loss and conversion of coastal wetlands typically occurs through draining, dredging, landfill, sediment diversion and hydraulic alteration.<sup>10</sup> Drainage of wetlands is particularly problematic because it not only causes loss of future sequestration potential, but also releases the soil’s carbon stock through oxidation.

While the anthropogenic drivers of coastal ecosystem loss are fairly well known, there are differences between the primary drivers of loss of mangrove, salt marsh, and sea grass. Conversion for agriculture, aquaculture (e.g. shrimp farming), and wood harvest are the principle contributors to mangrove loss, while salt marshes are typically drained for either agriculture or salt ponds.<sup>11</sup> They are also impacted by industrial/urban use and reduced sediment supply. Sea grass beds differ in that their loss is primarily driven by water quality degradation and mechanical damage from dredging, trawling, and anchoring.<sup>12</sup> These drivers vary geographically and the exact proportions of loss that can be attributed to each require

---

<sup>1</sup> Nellemen, C., Corcoran, E., Duarte, C.M., Valdés, L., De Young, C., Fonseca, L., and G. Grimsditch (Eds). 2009. Blue Carbon: The Role of Healthy Oceans in Binding Carbon. A Rapid Response Assessment. United Nations Environment Program (Nellemen et al. 2009).

<sup>2</sup> Laffoley, D. and G. Grimsditch (Eds.) 2009. The Management of Natural Coastal Carbon Sinks. IUCN.

<sup>3</sup> Nellemen et al. 2009. It should be noted that the concept of “blue carbon” does not extend to peat forests and wetlands that are not coastal. While there are certainly some similarities between these ecosystems that also store large quantities of soil organic carbon and blue carbon, there are also important differences and as a result they are not considered within blue carbon.

<sup>4</sup> Murray, B.C., Pendleton, L., Jenkins, W.A., and S. Sifleet. 2011. Green Payments for Blue Carbon: Economic Incentives for Protecting Threatened Coastal Habitats. Nicholas Institute Report (Murray et al. 2009).

<sup>5</sup> Van der Werf, G.R., Morton, D.C., DeFries, R.S., Olivier, J.G.J., Kasibhatla, P.S., Jackson, R.B., Collatz, G.J., and J.T. Randerson. 2009. CO<sub>2</sub> emissions from forest loss. *Nature Geoscience*, vol. 2: 737-738.

<sup>6</sup> Murray et al. 2011, *supranote 4*; FAO. 2011. State of the World’s Forests 2011. Available from: <http://www.fao.org/docrep/013/i2000e/i2000e00.htm>.

<sup>7</sup> Murray et al. 2011, *supranote 4*; Donato, C.D., Kauffman, J.B., Murdiyarto, D., Kurnianto, S., Stidham, M., and M. Kanninen. 2011. Mangroves among the most carbon-rich forests in the tropics. *Nature Geoscience*. Online 3 April 2011 (Donato et al. 2011).

<sup>8</sup> Donato et al. 2011, *supranote 7*.

<sup>9</sup> Murray et al. 2011, *supranote 4*.

<sup>10</sup> Crooks, S., Herr, D., Tamelander, J., Laffoley, D., and J. Vandever. 2011. Mitigating Climate Change through Restoration and Management of Coastal Wetlands and Near-Shore Marine Ecosystems: Challenges and Opportunities. The World Bank Environment Department, Paper #121 (Crooks et al. 2011).

<sup>11</sup> Murray et al. 2011, *supranote 4*.

<sup>12</sup> Murray et al. 2011, *supranote 4*.

more research.<sup>13</sup> For instance, one study found that drivers of mangrove loss varied widely by country, even within the same geographic region (South and East Asia).<sup>14</sup> In that study, 81% of mangrove loss was found to be from agricultural expansion, although in Indonesia, agriculture represented only 32% (aquaculture was 63%). However, another global study found that mangrove loss was primarily caused by conversion to aquaculture (38%) and only 1% was due to agriculture.<sup>15</sup> The costs of avoiding habitat conversion<sup>16</sup> also vary greatly by country, although one study found that a carbon price of US\$4-8 per tonne of CO<sub>2</sub>e, may be sufficient to protect some 100,000 – 800,000 ha of mangrove habitat. A price of US\$15 per tonne of CO<sub>2</sub>e may be sufficient to protect all mangrove habitat.<sup>17</sup> Indonesia, Mexico, and Malaysia all had break-even carbon prices below US\$5 per tonne of avoided emissions, while Brazil was approximately US\$7.<sup>18</sup>

Despite its significance and potential for cost effective net emissions reductions, blue carbon sinks and reservoirs have largely fallen outside of international and national climate change policies. While the United Nations Framework Convention on Climate Change (UNFCCC or the Convention) explicitly refers to the conservation and enhancement of sinks and reservoirs in coastal and marine ecosystems,<sup>19</sup> there have been virtually no discussions dedicated to these ecosystems under the Convention and the Kyoto Protocol so far, which may be due to a lack of understanding of the roles these ecosystems play in the carbon cycle. This is in striking contrast with the recent progress on forest-related negotiations, in particular with 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 (REDD+). These issues came to the fore as better data on emissions from deforestation emerged along with an offer from developing countries to help reduce these emissions.

### Report Scope and Objectives

This report was prepared at the request of the Linden Trust for Conservation to identify and describe (i) the developments in international and national climate finance with respect to mitigation activities targeting blue carbon, and (ii) the most promising opportunities for international policy interventions that would lead to the protection and restoration of coastal and marine ecosystems. The target audience for this report is stakeholders working on or interested in supporting blue carbon including intergovernmental organizations, governments, civil society, academics, foundations, and the private sector.

The objective of this study is to (i) assess options for protecting and/or restoring blue carbon sinks and reservoirs under existing and new international climate financing mechanisms; and (ii) advise on the actions necessary to take advantage of these options. This options assessment and advice will allow stakeholders to make informed decisions on where to focus efforts to promote policy changes to support the global reduction of greenhouse gas (GHG) emissions from blue carbon.

Three specific types of blue carbon are considered: mangroves, sea grass and salt marshes. Where no policy differentiation is warranted for a particular type of vegetation, the general expression “blue carbon sinks and reservoirs” is used.

This report is structured as follows: Following this Introduction, the second section provides a summary of the report’s key findings and recommendations. These highlight priority areas on which to focus efforts to

---

<sup>13</sup> Murray et al. 2011, *supranote* 4.

<sup>14</sup> Giri, C., Zhu, Z., Tieszen, L.L., Singh, A., Gillette, S., and J.A. Kelmelis. 2008. Mangrove forest distributions and dynamics (1975–2005) of the tsunami-affected region of Asia. *Journal of Biogeography*, 35(2008): 519–528.

<sup>15</sup> Valiela, I., Bowen, J.L., and J.K.L. York. 2001. Mangrove forests: one of the world’s threatened major tropical environments. *BioScience*, 51: 807–815.

<sup>16</sup> All of these cost estimates depend on a number of assumptions and may not factor in all the costs or effort that may be faced by a specific project or location within a country. The estimates are nonetheless a useful indication of approximate cost of avoiding conversion.

<sup>17</sup> Murray et al. 2011, *supranote* 4.

<sup>18</sup> Murray et al. 2011, *supranote* 4.

<sup>19</sup> Preamble and Article 4(1)(d) of the UNFCCC



affect policy changes. Section 3 outlines the Intergovernmental Panel on Climate Change (IPCC) reporting guidelines and includes key definitions and criteria which bear an impact on the treatment of blue carbon emissions and removals under the UNFCCC. Following section 3, a series of options for the inclusion of blue carbon sinks and reservoirs in climate frameworks are elaborated: the Kyoto Protocol (section 4), UNFCCC (section 5), regional and domestic trading programs (section 6), voluntary carbon standards (section 7), and other relevant areas (section 8). Annex I contains information related to fast-start finance relevant for blue carbon.

#### Methodology and authors

This report was prepared through a combination of desk research, interviews, and peer review. The authors include Robert O'Sullivan, Thiago Chagas and David Burns (Climate Focus) with contributions from Dr. Tim Pearson on IPCC reporting and guidelines (Winrock International). Dr. Charlotte Streck and Donna Lee reviewed and provided additional contribution within Climate Focus. Earlier drafts of the paper were also sent to the Linden Trust for Conservation, Conservation International, IUCN, Silvestrum, Wetlands International and the Coalition for Rainforest Nations for peer review. The report may be cited as; O'Sullivan R., Chagas T., Burns D., and Pearson T. *Blue Carbon Policy Options Assessment*, Climate Focus (2011).

## 2. Summary of Key Findings and Recommendations

### 2.1. Priority Recommendations

A number of opportunities exist to promote blue carbon as a legitimate climate change activity. However, promoting blue carbon as a new and separate agenda item under the UNFCCC in the same way as REDD+ was developed is unlikely to succeed. The current UNFCCC and Kyoto Protocol negotiations are already overloaded and adding yet another item to the list may be counterproductive in the short term – especially before IPCC reporting guidelines have been developed and improved and the impact of blue carbon is better understood. Any advocacy within the UNFCCC should therefore be focused on improving IPCC guidelines and integrating blue carbon into the existing NAMA and REDD+ agendas. The following are therefore our recommended “High Priority” actions for the next 18 months.

1. ***Develop and improve IPCC reporting guidelines where they do not adequately cover blue carbon sinks and reservoirs.*** A lack of confidence in the quantification of net climate benefits of blue carbon is a barrier to finance and incentive mechanisms including carbon markets. A priority should therefore be to support scientific research without delay to better quantify emissions and removals from changes to blue carbon sinks and reservoirs, such as salt marshes and mangroves, and with a particular focus on sea grasses which currently fall outside IPCC guidelines. The IPCC has proposed a process to produce supplemental guidance on these ecosystems by 2013.
2. ***Ensure NAMAs include actions that address blue carbon.*** For some countries, blue carbon may be a significant mitigation opportunity. NAMAs offer a potential source of financing while methodologies for carbon measurement are being developed and improved. NAMAs should focus on a combination of “readiness” and demonstration activities for sea grasses, salt marshes, and non-forest mangroves. Mangroves considered forests can be included within REDD+ action. Readiness activities would focus on increasing a country's understanding of emissions and removals from blue carbon sinks and reservoirs and their drivers of emissions, and what is needed to address them. Implementation should focus on demonstration activities to protect or restore blue carbon ecosystems, and may extend to an effort to access performance-based finance such as sectoral crediting or other mechanisms. It should be possible to work with at least two or three countries to develop and submit blue carbon NAMAs for funding within 18 months. Priority could

be given to working with Nigeria, Bangladesh, Cuba, India, Mozambique, Madagascar, Papua New Guinea, and the Philippines on readiness, and with Indonesia, Brazil, Mexico, and Malaysia on implementation.

3. **Utilize REDD+, which has more developed policy structures and could include mangroves that meet the definition of a forest.** Analysis and education is needed amongst developing countries to help them understand the implications that different forest definitions have on the inclusion of mangroves within REDD+. This should be capable of completion within a matter of months. Support is also needed for countries to gain a better understanding of the implications that mangrove forests may have on forest reference levels and reference emission levels developed by developing countries through 2011 and 2012 (as needed).
4. **Leverage the multiple benefits of blue carbon to access financing.** Protecting and restoring blue carbon sinks and reservoirs can have multiple benefits for climate change mitigation and adaptation, along with additional co-benefits such as biodiversity conservation. The ability to check a number of donor priorities or funding commitments within a single activity will increase the likelihood of accessing public funding from developed countries. A recommended short term priority is to access fast start finance to support the above activities. Accessing this funding should be possible within 18 months.

## 2.2. Overview of key findings

A summary of findings and recommendations are captured in the tables below. Tables 1 and 2 highlight potential international and national policy interventions, ranked by priority from highest to lowest based on a combination of analysis, desk review and interviews. The estimate of significance reflects the potential impact of the policy intervention on threatened blue carbon ecosystems. Table 3 highlights top priorities for each ecosystem over an eighteen month period.

**Table 1 Summary of potential international policy interventions**

Priority	Policy intervention	Effort needed to achieve success	Likelihood of achieving success	Significance for blue carbon if success achieved
HIGH	<b>Update/revise IPCC guidelines on blue carbon sinks and reservoirs</b>	Medium: Additional research and assessment required.	Medium – high: Will take longer time frame; revisions to guidelines expected after 2015.	High: Most policy interventions rely indirectly on clear IPCC guidance.
	<b>Support inclusion of mangroves within national REDD+ strategies</b>	Medium: Elements in place; additional effort requires research plus technical support.	Medium – high: Analysis on forest definition can be achieved quickly; soil carbon and reference levels will take time.	High: But not applicable for non-forest mangrove and other blue carbon ecosystems.
MEDIUM	<b>Investigate the possibility of developing sectoral crediting mechanism in the context of NAMAs</b>	Medium – high: Requires building a coalition to propose and support bottom-up sectoral mechanisms.	Medium: Additional time is needed to develop Measurement, Reporting and Verification (MRV) systems	Medium: Some uncertainty over demand.
	<b>Increase support under adaptation funding</b>	Low – medium: Effort needed to obtain funds will vary by source.	Medium – high: Restoring coastal ecosystems has recognized adaptation benefits.	Medium: Current levels of adaptation funding small, although expected to increase in the Green Climate Fund.
	<b>Increase recognition within the voluntary carbon market</b>	Low: Efforts already underway to expand VCS.	High: VCS Recognition expected in 2011. Methodology development and project registration may take longer.	Low - Medium: Voluntary market is small, but could provide important “proof of concept” demonstration.

Priority	Policy intervention	Effort needed to achieve success	Likelihood of achieving success	Significance for blue carbon if success achieved
	<b>Revise Kyoto Protocol (KP) accounting rules to include blue carbon sinks and reservoirs</b>	Med: Wetlands currently considered for inclusion in 2 <sup>nd</sup> commitment period (CP). High: Grassland, sea grasses not currently considered.	Med: Wetlands may be included in 2 <sup>nd</sup> CP. Very Low: Grassland and sea grasses unlikely to be included in 2 <sup>nd</sup> CP.	Med: Wetlands, if included in 2 <sup>nd</sup> CP, will be as an optional activity; few countries likely to include in accounting in near term. Any KP decision on accounting may affect a future UNFCCC agreement which is important.
LOW	<b>Revise JI rules related to LULUCF to include blue carbon projects</b>	High: Revise Annex I accounting rules as above and JI LULUCF crediting rules.	Very low: Unlikely in a KP second commitment period; revising JI crediting rules more feasible.	Low: Not key issue for KP Annex I countries; additional uncertainty around future of the KP.
	<b>Revise project based CDM rules</b>	High: Improve IPCC guidelines, expand scope of CDM, and revise CDM permanence rules. Activities not already covered under Annex I accounting rules will take the greatest effort.	Very low for recognition in a second commitment period. Medium for revising CDM permanence rules.	Uncertain: Significance is dependent on the future of the CDM and demand for CERs.
	<b>Revise CDM rules to include a sectoral mechanism and crediting</b>	High: Specific reference to sectoral CDM was dropped from the Kyoto Protocol negotiations. Revitalizing would require significant effort.	Very low for inclusion within a second commitment period.	Uncertain: Dependent on future of the CDM and demand for CERs; however, could improve current CDM project based approach.

Table 2 Summary of potential national policy interventions

Priority	Policy intervention	Effort needed to achieve success	Likelihood of achieving success	Significance for blue carbon if success is achieved
HIGH	<b>Support readiness activities under NAMAs</b>	Medium: Identify and work with countries to develop demonstration activities.	Medium to high within the next 5 years.	High: Generates early emission reductions and creates transaction and institutional models that can be scaled up. Data collection and knowledge generation for development of future mechanisms.
	<b>Access fast start finance (through NAMAs and REDD+)</b>	Low – medium: Effort needed to obtain funds will vary by source.	Medium – high, especially if combining mitigation and adaptation benefits.	Medium: Supports early activities that could lead to funding under future instruments such as the Green Climate Fund.
MEDIUM	<b>Approval of blue carbon methodologies under Australia's Carbon Farming Initiative (CFI)</b>	Low - medium: Efforts are underway to prepare methodologies but additional advocacy may be needed.	Medium: Timing will vary depending on blue carbon methodology and time taken to raise awareness within the Australian government.	Low - medium: CFI market small; but can help increase knowledge and demonstrate proof of concept. Recognition within an Annex I government program is an added benefit.
	<b>Inclusion of blue carbon within California's AB-32</b>	Medium - high: Some advocacy and interest exists, but developing general protocols under California's rules may be difficult.	Uncertain.	Low – medium: Total offset demand from sectoral credits is limited; but could provide proof of concept.



Priority	Policy intervention	Effort needed to achieve success	Likelihood of achieving success	Significance for blue carbon if success is achieved
LOW	<b>Lobby the EU Commission to accept LULUCF (and blue carbon types not included under LULUCF) after 2020</b>	Medium - high: Requires building political pressure to influence discussions related to forestry under the EU ETS in the Commission, as well as generating awareness of the science and mitigation potential of blue carbon activities.	Low: Too much uncertainty on the inclusion CDM and JI LULUCF after 2020. High uncertainty also exists as to the extent CDM and JI will be operational, and recognize blue carbon related activities, by 2020.	Medium: The EU ETS is currently the largest market for CDM credits, but high uncertainty over what the demand would be and the potential quantitative limitations to the use of international credits after 2020.
	<b>Inclusion of blue carbon within Art 24 or 24a of EU ETS</b>	Medium -high: Political resistance both to domestic off-setting and carbon sequestration from biological systems.	Uncertain.	Low – medium: Limited to blue carbon ecosystems within EU member states.

**Table 3 Priorities over the next 18 months categorized by ecosystem**

Priority	Mangrove forests	Non-forest mangroves	Salt marshes	Sea grasses
<b>HIGH</b>	<ul style="list-style-type: none"> <li>Improve IPCC guidelines</li> <li>REDD+ forest definition</li> <li>Inclusion in REDD+ reference emission levels</li> <li>Include in national REDD+ readiness planning</li> <li>Access fast-start finance</li> </ul>	<ul style="list-style-type: none"> <li>Improve IPCC guidelines;</li> <li>NAMAs to develop national strategies, MRV systems, national inventories</li> <li>Access fast-start finance</li> </ul>	<ul style="list-style-type: none"> <li>Improve IPCC guidelines;</li> <li>NAMAs to develop national strategies, MRV systems, national inventories</li> <li>Access fast-start finance</li> </ul>	<ul style="list-style-type: none"> <li>Improve science;</li> <li>NAMAs to develop national strategies, MRV systems, national inventories</li> <li>Access fast start finance</li> </ul>
<b>MEDIUM</b>	<ul style="list-style-type: none"> <li>Seek funding via adaptation funding</li> <li>Support methodology development under Australia's CFI</li> </ul>	<ul style="list-style-type: none"> <li>Seek funding via adaptation funding</li> <li>Support sectoral crediting under NAMAs</li> <li>Support methodology development under Australia's CFI</li> </ul>	<ul style="list-style-type: none"> <li>Seek funding via adaptation funding</li> <li>Support sectoral crediting under NAMAs</li> <li>Support methodology development under Australia's CFI</li> </ul>	<ul style="list-style-type: none"> <li>Seek funding via adaptation funding</li> </ul>

### 3. IPCC reporting guidelines

In order to assess the inclusion of blue carbon sinks and reservoirs under the UNFCCC and the Kyoto Protocol, it is important to first understand the Intergovernmental Panel on Climate Change (IPCC) reporting guidelines. Parties to the Convention use IPCC guidelines to prepare their national inventories of GHG emissions and removals. Annex I countries (developed countries) who are Party to the Kyoto Protocol also use additional supplemental IPCC guidelines to estimate and report land-use related emissions and removals for use under the Kyoto Protocol. IPCC guidelines are also used as the basis for accounting under the project-based mechanisms of Joint Implementation (JI) and the Clean Development Mechanism (CDM). In short, IPCC guidelines underpin all reporting and accounting for emission reductions and removals under the UNFCCC and its Kyoto Protocol.

#### 3.1. Key Findings

- IPCC reporting guidelines do not adequately cover blue carbon sinks and reservoirs and need to be updated. This should be a priority.
- Additional research is needed to update IPCC guidelines.



## 3.2. IPCC guidance

### Findings and recommendations

The following topics need further work to allow the IPCC to provide additional guidance on reporting of blue carbon emissions and removals:

- The rate of accumulation of carbon in soil in blue carbon sinks and reservoirs. Accumulation should be separated into the proportions derived from sequestration by the plants growing on site and the proportion trapped as sediment but sequestered elsewhere.
- Defaults for above-ground biomass accumulation in mangroves. Optimally this would be disaggregated by region and by mangrove form (shrub vs. tree).
- Defaults for soil carbon stock under different forms of blue carbon.
- The proportion of soil carbon that is emitted into the ocean and atmosphere when blue carbon areas are cleared and over what time period emission occurs. This should include the proportion of soil carbon washed out to sea and permanently buried at depth in the ocean when blue carbon is cleared.

The UNFCCC Subsidiary Body for Scientific and Technological Advice (SBSTA) requested in June 2010, and again in December 2011, for the IPCC to explore issues related to reporting on wetlands. This has resulted in a proposal by the IPCC Task Force to create a “2013 Supplement to 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands” that will include, if appropriate, guidance for estimating emissions and removals from coastal wetland ecosystems including mangroves, saltmarshes, and sea grasses.

IPCC guidance underpins many areas of UNFCCC reporting and Kyoto Protocol accounting. Updating IPCC guidance, including supporting additional research in order to do so should be a high priority.

### Background

The IPCC provides guidance on GHGs, including emissions and removals for land use and land-use conversions. The 2006 IPCC Guidelines for National Greenhouse Gas Inventories (2006 IPCC Guidelines) is currently the most comprehensive IPCC document on GHG reporting, though it has not been formally adopted yet by the COP. The 2006 IPCC Guidelines incorporate an earlier 1996 version and the 2003 IPCC Good-Practice-Guidance on Land Use, Land-Use Change and Forestry (2003 GPG-LULUCF) with additional improvements. Volume 4 of the Guidelines provides technical guidance on the Agriculture, Forestry and Other Land Use Sector (AFOLU)<sup>20</sup>. The Guidelines, like the GPG-LULUCF before it, incorporates six broad land use categories for estimating and reporting GHGs from the AFOLU sector. The IPCC states that “the categories are broad enough to classify all land areas in most countries”.<sup>21</sup> The categories are:

- 1) Forest Land
- 2) Cropland
- 3) Grassland
- 4) Wetlands
- 5) Settlements
- 6) Other Land

The Guidelines use a tiered approach to estimating and reporting emissions and removals, with increasing levels of accuracy from Tiers 1-3. Within each of the six land-use categories outlined above, carbon stock

---

<sup>20</sup> AFOLU is essentially the same as LULUCF, with the addition of agriculture. The inclusion of agriculture reduces the chance of double counting or omissions. Previous versions contained a somewhat arbitrary distinction between the categories, and their integration promotes consistent use of data and GHGs to allow for more consistent treatment of land conversions. The IPCC Guidelines also include extended default data and improved methods for calculating GHG emissions and removals. See Eggleston, S., and N. Srivastava. 2008. *AFOLU in the IPCC 2006 Guidelines*. Presentation at the Third Informal Dialogue on LULUCF. Reykjavik, Iceland, 7-9 May 2008. Available at <http://www.ipcc-nggip.iges.or.jp/presentation/LULUCF-AFOLU.pdf>.

<sup>21</sup> IPCC. 2006. *Guidelines for National Greenhouse Gas Inventories.. Vol 4, Agriculture, Forestry and Other Land Use, Chapter 3.*

changes are estimated for each stratum (i.e. subdivisions based on climate zone, ecotype, soil type, etc.) of managed lands for the five carbon pools: above-ground biomass, below-ground biomass, dead wood, litter, and soil organic matter.<sup>22</sup>

### Assessment

The relevant land categories for blue carbon are forest land, grasslands, and wetlands. Within these categories all of the pools can be relevant for different blue carbon ecosystems except sea grasses. Given their status as marine ecosystems, IPCC land use categories would not apply.

#### *Blue carbon as forest land*

The 2006 IPCC Guidelines defines 'forest land' as:

"all land with woody vegetation consistent with thresholds used to define Forest Land in the national greenhouse gas inventory. It also includes systems with a vegetation structure that currently fall below, but *in situ* could potentially reach the threshold values used by a country to define the Forest Land category."<sup>23</sup>

The category includes both drylands and wetlands, thus any mangrove system covering sufficient area (0.05 to 1 ha – determined nationally), having sufficient canopy cover (10 to 30% - determined nationally) and reaching a sufficient height (2 to 5m – determined nationally) would be considered forest. Of the blue carbon types considered in this report, only mangroves can be considered as forest land. The area and canopy cover requirements will be met by almost all mangroves regardless of national definition.

Height is therefore the key determinant for mangroves. There are approximately 65 mangrove species in the world - these species includes shrubs of just 1/2m height to trees up to 40m tall. Any mangrove system meeting the forest definition requirements would therefore fall under the Forest Land category.

#### *Blue carbon as grassland*

The IPCC defines grasslands as:

"rangelands and pasture lands that are not considered cropland. It also includes systems with woody vegetation and other non-grass vegetation such as herbs and brushes that fall below the threshold values used in the forest land category. The category also includes all grassland from wildlands to recreational areas."<sup>24</sup>

Salt marshes consist of halophytic (salt-tolerant) grasses, herbs and shrubs. They are not pasture lands but can be considered wildlands dominated by grasses, and could therefore meet this definition. Mangroves which are too short to meet the definition of forest would only classify as grasslands if they contained grasses. If they did not contain significant grass cover they would likely fall outside the definition of grassland.

#### *Blue carbon as wetlands*

The 2006 IPCC Guidelines broadly define wetlands as:

"areas of peat extraction and land that is covered or saturated by water for all or part of the year (e.g. peatlands) and that does not fall into the Forest Land, Cropland, Grassland or Settlements categories. It includes reservoirs as a managed sub-division and natural rivers and lakes as unmanaged sub-divisions."<sup>25</sup>

---

<sup>22</sup> IPCC. 2006. Vol. 4, Chapter 2, *supranote* 21.

<sup>23</sup> IPCC. 2006. Vol. 4, Chapter 3, *supranote* 21.

<sup>24</sup> IPCC. 2006. Vol. 4, Chapter 3, *supranote* 21.

<sup>25</sup> IPCC. 2006. Vol. 4, Chapter 2, *supranote* 21.

Wetlands are a default category that includes all blue carbon sinks and reservoirs that do not meet other definitions (with the exception of sea grasses – see below). Mangroves and salt marshes that do not meet the definition of forest or grassland should fall under this category.

Blue carbon *land* areas not considered forest land or grassland would by default fit into the wetland category. However in the 2006 IPCC Guidelines the wetland category is focused exclusively on a narrow definition of managed wetlands, i.e. “wetlands where the water table is artificially changed... or those created through human activity”. As a result, it would exclude losses to mangroves or salt marshes that are not associated with artificially changing the water table, for example, through de-vegetation of mangroves.

#### *Blue carbon outside IPCC categories*

Sea grasses do not seem to fit under any IPCC definition. Sea grasses are found permanently under water in clear marine environments. As they are not a land use they are not covered currently under “Agriculture, Forestry and Other Land Uses” nor, more obviously, under the other key IPCC groupings (Energy; Industrial Processes and Product Use; Waste).

#### *Additional gaps in IPCC accounting*

Current IPCC guidance does not provide emission or removal factors for most blue carbon. In the forest land category there is no discussion of mangroves, carbon accumulation in mangroves or carbon losses from drained mangroves. And there are no default values included for mangrove systems. In the grassland category there is no discussion of salt marshes and no defaults specific to salt marshes.<sup>26</sup> Sea grasses are fully excluded and the wetland category does not mention any type of blue carbon land use or stocks<sup>27</sup>. The result is that any country seeking a simple Tier 1 approach would not be able to proceed.

That said, the existing methods (gain-loss and stock change) for the relevant categories would still be appropriate. Countries employing a high Tier 2 or Tier 3 approach could likely account for blue carbon sinks and reservoirs within the existing guidance, conditioned on the availability of specific factors and data, or the resources to develop these factors and data. However, specific focus may be needed on soil carbon stocks sequestered elsewhere and deposited in the blue carbon system versus sequestration happening on site.

#### *Updates to IPCC*

In June 2010, the SBSTA “invited the IPCC to organize an expert meeting... to explore the need and ways to clarify, improve and provide updated information... [on] gaps related to some uses of wetlands which are currently not fully covered, for example the drainage of wetlands, the rewetting of previously drained wetlands or wetland restoration”.<sup>28</sup> The IPCC reported back to the SBSTA in December 2010 at COP-16 in Cancun, where the SBSTA took note of the report and invited the IPCC to “undertake further methodological work on wetlands, focusing on the rewetting and restoration of peatland, with a view to filling in the gaps in the 2006 IPCC Guidelines for National Greenhouse Gas Inventories... in these areas and to complete this work for the 39<sup>th</sup> session of the SBSTA”<sup>29</sup> (COP-19 in December 2013).

The current proposal by the IPCC Task Force includes a “2013 Supplement to 2006 Guidelines for National Greenhouse Gas Inventories: Wetlands”. The proposed supplement would include tiered methodological approaches and new and/or updated methods and default emission factors, where appropriate. The proposed Table of Contents includes a section on “Coastal Wetlands” that includes mangroves, saltmarshes, seagrass and tidal freshwater systems—although it is unclear if the Task Force will be able to address all these systems with new guidance and will likely depend on the state of the science and available

---

<sup>26</sup> The lack of defaults for both forests and grasslands indicates both a lack of consideration of blue carbon and removing the possibility of Tier 1 or simple Tier 2 accounting approaches.

<sup>27</sup> Indicating the lack of direct consideration of these ecosystems by the authors and adding to the complexity for any inclusion in accounting

<sup>28</sup> FCCC/SBSTA/2010/L.12, Article 7 and Annex III.

<sup>29</sup> Document FCCC/SBSTA/2010/L.18, paragraph 4.

methods. Finally a work plan has been proposed through the end of 2013 for the Task Force to complete its work for this new Supplement.<sup>30</sup>

## 4. Incentives for blue carbon mitigation under the Kyoto Protocol

The Kyoto Protocol has set caps on GHG emissions in developed countries for 2008 – 2012 and established three “flexible mechanisms” to *inter alia*, help reduce the costs of meeting these caps. Joint Implementation (JI) is the project based mechanism operating in Annex I countries while the Clean Development Mechanism (CDM) recognizes certain mitigation projects in developing countries. The CDM has the additional purpose of supporting sustainable development in developing countries. The third flexible mechanism is international emissions trading, that allows the trade of offset credits. The CDM, JI, and international emissions trading have created a multi-billion dollar market for offset credits which has helped support thousands of mitigation projects (3,131 in the CDM and 294 in JI to date) that have generated hundreds of millions of offsets (621 million from the CDM).<sup>31</sup> In 2009 the Primary and Secondary CDM markets alone were valued at over US\$20.2 billion.<sup>32</sup> Currently, CDM CERs are trading at EUR 13.11, or US\$18.82 on the secondary market.<sup>33</sup> Additional domestic emission reductions have also been driven by countries with caps under the Kyoto Protocol – at least in those sectors where Annex I countries are obliged to account for those emissions.

However, the future of the Kyoto Protocol and its flexible mechanisms is still being negotiated and is uncertain. Including blue carbon in Annex I countries emission reduction commitments and the flexible mechanisms could be an important source of finance to help protect and restore blue carbon ecosystems - if the Kyoto Protocol and its flexible mechanisms continue.

### 4.1. Key Findings

- Blue carbon is not fully covered in current Kyoto Protocol accounting rules for Annex-I countries.
- A CMP (“COP-Meeting of the Parties”, the governing body of the Kyoto Protocol) decision is required to change Annex I LULUCF accounting rules so that blue carbon (in particular, wetlands) is recognized within Annex I emission limitation or reduction commitments.
- More research is needed on quantifying and monitoring sea grasses before a discussion could be launched on adding this marine ecosystem into the accounting framework.
- If LULUCF remains outside Annex I emission reduction commitments, additional changes to JI accounting rules would be needed to recognize emissions reductions from blue carbon under JI. This process is likely to be difficult and time-consuming and, therefore, not recommended as a priority.
- The recognition of carbon sequestration under the CDM is limited to Afforestation and Reforestation (A/R) activities. A small scale methodology already exists for mangroves and a large scale methodology was approved by the A/R Working Group in May 2011. Extending the CDM

<sup>30</sup> See IPCC-XXXIII/Doc. 7 (11.IV.2011) available at: [http://ipcc.ch/meetings/session33/doc07\\_p33\\_tfi\\_activities.pdf](http://ipcc.ch/meetings/session33/doc07_p33_tfi_activities.pdf).

<sup>31</sup> See [www.unfccc.int](http://www.unfccc.int).

<sup>32</sup> Hamilton, K. et al. 2010. *Building Bridges: State of the Voluntary Carbon Markets 2010; A Report by Ecosystem Marketplace & Bloomberg New Energy Finance*. (Hamilton et al. 2010).

<sup>33</sup> As of May 6, 2010, using a conversion rate of US\$1 = 0.6965 EUR.

into new project activities covering blue carbon will be extremely difficult in time for the next commitment period.

## 4.2. Annex I Accounting under the Kyoto Protocol

### Findings and Recommendations

Kyoto Protocol (KP) accounting requires agreement on eligible activities. The most recent version of (2006) IPCC guidance includes forests, grasslands and wetlands, which would cover mangroves and salt marshes. However, grassland and wetland management are currently excluded from the list of eligible KP activities.. Sea grasses are neither included in IPCC guidance, nor under KP accounting rules.

Expanding KP rules to include blue carbon would require the following changes to Annex I accounting:

- Inclusion of activities on grassland (thereby capturing salt marshes). This would require a new definition for activities such as “grassland management”, “grassland conservation”, and/or “grassland restoration”.Inclusion of wetland activities. Discussions under the KP are advancing on this topic: however, revising the proposed definition of “rewetting and drainage” may be necessary to capture a fuller range of blue carbon.
- Inclusion of activities that encompass sea grass conservation and restoration. This will be the most difficult as this activity is not currently covered in IPCC guidance. It may also require an amendment to either Annex A or Article 3 of the Kyoto Protocol in order to be included in future GHG accounting.

If blue carbon (and LULUCF generally) is to be included in Annex I country’s emission limitation or reduction commitments (caps) additional changes to Annex A of the Kyoto Protocol to list these sources would also be required.

A deeper understanding of, and confidence in, the ability to measure and monitor sequestration and emissions from blue carbon can help to facilitate these changes. This will require additional research to quantify emissions and removals in Annex I<sup>34</sup> countries, in particular salt marshes, and to develop Tier 1 factors to update IPCC guidelines for blue carbon ecosystems worldwide.

Even with improved IPCC guidelines and greater understanding of the amount of emissions coming from the loss of blue carbon sinks and reservoirs, any inclusion in the Kyoto accounting system would likely come under Article 3.4. As Article 3.4 accounting is currently optional, this will likely result in patchy inclusion in Annex I accounting in practice. Even though the future of the Kyoto Protocol is uncertain, any agreements on accounting under the Kyoto Protocol will likely trickle over to a future UNFCCC agreement. As a result the status of blue carbon under the Kyoto Protocol may be relevant.

### Background

Emissions that are included in industrialized country’s emission limitation or reduction commitments (caps) under the Kyoto Protocol are listed in Annex A to the Protocol. This list does not include LULUCF. As a result LULUCF emissions and removals are not (normally) calculated in a country’s cap.<sup>35</sup> Rather, net

---

<sup>34</sup> It should be noted that “Annex I” is commonly used to refer to industrialized countries that have assumed a quantified emission limitation or reduction commitments (caps) under the Kyoto Protocol. This is technically incorrect. Industrialized countries are listed in Annex I to the UNFCCC whereas the countries that have assumed binding caps under the Kyoto Protocol are listed in Annex B to the Protocol. The lists of countries are very similar, though there are some differences relating to political changes in Eastern Europe between the dates of the UNFCCC (1992) and the Kyoto Protocol (1997) and some Annex I countries not taking a commitment under the Kyoto Protocol (e.g. Turkey). To avoid confusion we follow the commonly used reference of “Annex I countries” to refer to countries with caps under the Kyoto Protocol.

<sup>35</sup> Under Article 3.7, if land-use change and forestry (LUCF) constituted a net source of greenhouse gas emissions in 1990, a country may include this in their base year emissions (that are used to calculate the cap). This exception was negotiated by Australia which had net LUCF emissions in 1990.

LULUCF removals are able to be used by a country to offset their emissions from capped sectors.<sup>36</sup> The accounting for LULUCF is found in Article 3 of the Kyoto Protocol. Annex I Parties must account for emissions by sources and removals by sinks of GHGs from afforestation, reforestation and deforestation activities pursuant to Article 3, paragraphs 3 and may account for other LULUCF activities under Article 3 paragraph 4 of the Protocol. Article 3.4 of the Protocol is less specific than Article 3.3, stating:

“... additional human-induced activities related to changes in greenhouse gas emissions by sources and removals by sinks in the agricultural soils and the land-use change and forestry categories shall be added to, or subtracted from, the assigned amounts for Parties included in Annex I.”

Unlike Article 3.3, which refers to specific activities, Article 3.4 sets out the categories of additional LULUCF activities that Parties may account for. These activities were further clarified in a subsequent decision which allows for optional accounting of emissions and removals from revegetation, forest management, cropland management and grazing land management under Article 3.4.<sup>37</sup>

Threshold values for ‘forest’ provided under the Kyoto Protocol follow guidance from the CMP (the Meeting of the Parties to the Kyoto Protocol). Under this guidance, countries are free to adopt their own definition of forest provided it fits within agreed ranges for height and crown density.<sup>38</sup>

In COP-16/CMP.6 in Cancun, the parties decided to adopt the same first-commitment period definitions of forest, afforestation, reforestation, deforestation, revegetation, forest management, cropland management and grazing land management for the second commitment period.<sup>39</sup> A number of issues were still to be decided, including whether to include wetlands, whether forest management will remain as an optional activity, how to determine reference levels for forest management, and whether a cap should be applied to emissions and removals from forest management.<sup>40</sup>

### Assessment

Under the Kyoto Protocol not all LULUCF emissions and removals are accounted for in the same way. Afforestation, reforestation, deforestation (Article 3.3) and forest management (Article 3.4) – or Land-Use Change and Forestry (LUCF) – follow “gross-net” accounting, in which emissions and removals are not counted in the base year (1990), but are counted in the commitment period. This means that the relevant emissions are not factored into the amount of assigned amount units (AAUs)<sup>41</sup> the Party received at the start of the commitment period, but reductions and removals that occur during the commitment period are eligible to offset base year emissions.<sup>42</sup> The remaining Article 3.4 activities (revegetation, crop land

<sup>36</sup> For a more detailed discussion see Trines E. “History and Context of LULUCF in the Climate Regime” in Streck C., O’Sullivan R., Janson-Smith T., and Tarasofsky R., (eds) *Climate Change and Forests: Emerging Policy and Market Opportunities*, Brookings Institute and Chatham House, 2008.

<sup>37</sup> UNFCCC Decision 16/CMP.1, Annex, para 6.

<sup>38</sup> Annex of Decision 16/CMP.1 states that forests encompass “a minimum area of land of 0.05–1.0 hectare with tree crown cover (or equivalent stocking level) of more than 10–30 per cent with trees with the potential to reach a minimum height of 2–5 meters at maturity *in situ*. A forest may consist either of closed forest formations where trees of various stories and undergrowth cover a high proportion of the ground or open forest. Young natural stands and all plantations which have yet to reach a crown density of 10–30 per cent or tree height of 2–5 meters are included under forest, as are areas normally forming part of the forest area which are temporarily unstocked as a result of human intervention such as harvesting or natural causes but which are expected to revert to forest.”

<sup>39</sup> UNFCCC Decision 2/CMP.6, para 2.

<sup>40</sup> UNFCCC Decision 2/CMP.6, para 3.

<sup>41</sup> AAUs are issued by Annex I countries – i.e. those countries with caps under the Kyoto Protocol. The amount of AAUs issued equals the amount of emissions a country can emit during the first commitment period and is calculated (more or less) against the base year of 1990.

<sup>42</sup> A notable exception to this is for Parties whose LUCF constituted a net source of emissions in 1990, who must then apply “net-net” accounting, per Article 3.7 of the Kyoto Protocol. This exception was negotiated by Australia during the Kyoto Protocol negotiations. Australia had significant emissions from deforestation in 1990 that had already been reduced by 1997, thereby in effect making it significantly easier for Australia to meet its emission reduction



management, and grazing land management) follow “net-net” accounting, in which the relevant emissions and removals are counted in the base year and in the commitment period.

While net-net accounting is more sound from an environmental perspective, gross-net accounting was chosen by the Parties for forestry sector activities to address the “legacy effect,” in which a country’s uneven age class distributions of forests due to past forest management practices can impact its accounting under Kyoto. Because forests sequester carbon at a slower rate as they mature, if net-net accounting with a historical reference level (i.e. net emissions in a base year) were used, Parties with young forests (due to past logging practices) will receive less sequestration credits as their forests mature, making it harder for them to meet reduction commitments (even if reductions occur in other sectors). Gross emissions may thus decrease, but a reduction in removals may produce a net increase, simply due to past forestry management practices. By not accounting for LUCF in the base year, the legacy effect is overcome. The non-LUCF Article 3.4 activities can apply net-net accounting because changes to these carbon pools occur much more quickly and the legacy effect is not an issue.

Currently, blue carbon sinks and reservoirs are not fully accounted for under the Kyoto Protocol. Only some mangroves are likely to meet the Kyoto Protocol definition of a forest, but even if they do the IPCC does not provide adequate default values to estimate changes in all relevant carbon stocks in these ecosystems. Thus, depending on the threshold values adopted by each country in their definition of forests, mangroves could be partially recognized under afforestation, reforestation or deforestation categories. Accounting for wetlands (which may include salt marshes and non-forest mangroves), grasslands (which may include salt marshes) and sea grasses is currently absent. In particular, sea grasses fall outside IPCC guidance, do not fall under any LULUCF category, and may require an amendment to either Annex A or Article 3 of the Kyoto Protocol in order to be included in future GHG accounting.

#### *Possible developments*

The current negotiations on the future of the Kyoto Protocol include suggested changes to LULUCF accounting. One version of the negotiating text<sup>43</sup> invites the IPCC to revise and develop supplementary methodologies for estimating anthropogenic GHG emissions and removals under Article 3.3 and 3.4, on the basis of, *inter alia*, GPG-LULUCF,<sup>44</sup> and requests the SBSTA to consider developing a work program to explore, *inter alia*, “rewetting and drainage”.<sup>45</sup> The activity was principally included to account for emissions from peat drainage and harvesting in Iceland and Eastern Europe. The term “rewetting and drainage” is defined as:

“a system of practices for rewetting and draining on land with organic soil that covers a minimum area of 1 hectare. The activity applies to all lands that have been drained and/or 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”<sup>46</sup>

Accounting would be based on IPCC estimation methodologies for wetlands, lands converted to wetlands and land use on drained organic soils,<sup>47</sup> and limits the application of rewetting and drainage to these categories. The following would therefore be excluded: blue carbon ecosystems with mineral soils (e.g. some mangroves), that fall into categories other than “wetlands” (e.g. salt marshes classified as grasslands), and activities that do not involve changes to the soil water table (e.g. loss of non-forest

---

commitments if it applied net-net accounting to Article 3.3 activities. This data was not well known by other countries during the negotiations. This highlights both the importance of the LULUCF sector within the negotiations along with transparency in emission and sequestration data.

<sup>43</sup> There are currently three options being considered. The “Integrated Text”, Option A, and Option B as set out in FCCC/KP/AWG/2010/18/Add.1, Chapter II.

<sup>44</sup> See FCCC/KP/AWG/2010/18/Add.1, Chapter II, Para 10.

<sup>45</sup> See FCCC/KP/AWG/2010/18/Add.1, Chapter II, Para 18.

<sup>46</sup> See FCCC/KP/AWG/2010/18/Add.1, Chapter II, Annex I, Para 1(i).

<sup>47</sup> See FCCC/KP/AWG/2010/18/Add.1, Chapter II, Annex I, Para 14.





mangroves not associated with drainage). Another option of the proposed text, however, suggests including “wetlands management” in a third commitment period, although the term is not defined.<sup>48</sup>

The negotiating text is inconsistent on whether rewetting and drainage would be included in a second or third commitment period<sup>49</sup> but in either case it will fall under Article 3.4 accounting.

If drainage and rewetting or wetland management were included in accounting under Article 3.4 it would still only be an optional accounting activity. Moreover, even if Article 3.4 accounting was broadened to include other activities affecting blue carbon it would still only provide patchy coverage as countries could choose to exclude it from their accounting if monitoring was too difficult or if it was a source of emissions they did not want to reduce. More comprehensive revisions to Annex I LULUCF accounting to make accounting for all LULUCF emissions and removals mandatory is not on the agenda for the second commitment period, and therefore highly unlikely in the medium term. There is also significant uncertainty over the future of the Kyoto Protocol, although any changes to the accounting rules are likely to flow over into discussions of any future agreement under the UNFCCC.

### 4.3. Joint Implementation (JI)

#### Findings and Recommendations

Using JI to protect blue carbon sinks and reservoirs would first require changes to Annex I LULUCF accounting rules so that activities affecting blue carbon are included in Article 3.3 or 3.4 of the Kyoto Protocol. This is discussed in detail above and is not recommended as a high priority. Next it will require additional changes to the crediting rules for JI LULUCF projects to allow Assigned Amount Units (AAUs) or removal units (RMUs) to be converted into emission reduction units (ERUs) for JI LULUCF projects. As with the changes to Annex I LULUCF accounting, these changes to the JI rules will require a dedicated effort by a number of Annex I countries. Past efforts to change these rules for other JI projects has not been successful as it was not seen as a priority by a sufficient number of countries.

Given the uncertainty around the future of the Kyoto Protocol, the uncertainty around the contribution of blue carbon sinks and reservoirs in Annex I countries, the exclusion of ERUs from LULUCF projects from the EU emission trading system (EU ETS), and the difficulties in achieving the necessary changes, additional policy work to support the recognition of blue carbon within JI is not recommended as a priority.

Using the “Green Investment Scheme” concept is a simpler option that does not require any changes to Annex I accounting rules or JI rules. Under the Green Investment Scheme concept the proceeds from the sale of AAUs is used for environmental purposes. These environmental purposes may quantifiably reduce a country’s emissions that are recorded under Annex I accounting or only have indirect or un-quantified benefits. It is therefore theoretically possible to use these schemes to support conservation of blue carbon ecosystems if there is sufficient political will. Further review and analysis including assessing the political will of Annex I countries with threatened marine ecosystems is beyond the scope of this report.

#### Assessment

Including blue carbon ecosystems in JI is not as simple as expanding Article 3.3 and 3.4 accounting to include blue carbon-related activities. Under current rules JI LULUCF projects need to convert RMUs into ERUs – they cannot convert AAUs into ERUs as is the case with other JI projects.<sup>50</sup> RMUs are only issued if there is net *sequestration* of carbon under Article 3.3 and 3.4 accounting. Emission reductions (such as from protecting or restoring blue carbon ecosystems) do not generate RMUs, therefore even if these

<sup>48</sup> See FCCC/KP/AWG/2010/18/Add.1, Chapter II, Option B, Para 4.

<sup>49</sup> In one instance the text refers to inclusion in the second commitment period accounting, whereas another refers to the third commitment period. See FCCC/KP/AWG/2010/18/Add.1, Chapter II, Para 18 for a reference to the third commitment period, and Chapter II, Annex I, Para 13 for a reference to the second.

<sup>50</sup> UNFCCC Decision 14/CMP.1 *Standard electronic format for reporting Kyoto Protocol units, Annex, Standard electronic format for reporting of information on Kyoto Protocol units*, para 13.



activities were included in Article 3.3 or 3.4 accounting they could not in fact generate ERUs unless an Annex I country recorded a net sequestration from other activities under Articles 3.3 and 3.4. This is further reinforced and complicated by the JI LULUCF project design document, which only refers to net anthropogenic *removals* by sinks.<sup>51</sup> It does not recognize that individual JI LULUCF projects may be a source of emission reductions rather than just removals.

This can be corrected by the following amendment to Decision 14/CMP.1 (*Standard electronic format for reporting Kyoto Protocol units, Annex, Standard electronic format for reporting of information on Kyoto Protocol units*), paragraph 13(a)(ii):

*(ii) The Party shall report under 'Subtractions' the corresponding quantity of AAs converted, or, in the case of land use, land-use change and forestry (LULUCF) projects, the corresponding quantity of [AAs or] RMUs converted, pursuant to paragraph 29 of the annex to decision 13/CMP.1.*

And an amendment to paragraph 13(b)(ii) so that it reads as follows:

*(ii) The Party shall report under 'Subtractions' the corresponding quantity of AAs converted, or, in the case of LULUCF projects, the corresponding quantity of [AAs or] RMUs converted, pursuant to paragraph 29 of the annex to decision 13/CMP.1.*

Implementing this amendment will also require a number of changes to the UNFCCC registry system.

#### 4.4. Clean Development Mechanism (CDM)

##### Findings and Recommendations

The CDM already recognizes mangrove A/R activities. A small scale methodology was already approved by the CDM Executive Board and a large scale methodology was approved by the A/R Working Group in May 2011,<sup>52</sup> so additional work on CDM A/R methodologies is not a priority.

Expanding the CDM beyond A/R to other blue carbon ecosystems will be difficult. This is because of i) a lack of understanding over the amount of emissions from blue carbon; and ii) a lack of IPCC guidance on how to accurately assess these emissions and removals. Both of these unknowns will almost certainly result in strong opposition to including these systems within the CDM until they have been resolved. Moreover, the future of the Kyoto Protocol and demand for certified emission reduction credits (CERs) – particularly CERs from CDM A/R projects – is uncertain. Lobbying for the expansion of the CDM should not be an immediate priority. Efforts should be directed towards quantifying blue carbon emissions in developing countries and developing IPCC guidance on estimating these emissions and removals. Once these steps have been completed there may be scope for expanding the scope of the CDM to other activities. Changing the rules on using temporary CERs (tCERs) and long-term CERs (lCERs) to address permanence is also needed.

##### Background

The CDM was established under Article 12 of the Kyoto Protocol to allow emission reduction projects in developing countries (Non-Annex I) to earn CERs that could be used by Annex I countries to meet their emission reduction commitments. CDM LULUCF projects are currently limited to A/R projects only.<sup>53</sup> Before a non-Annex I Party can host a CDM A/R project it must first report to the Executive Board its definition of a forest for the purposes of the CDM using minimum values for tree cover (between 10 and 30 percent), land area (between 0.05 and 1 ha), and tree height (between 2 and 5 meters).<sup>54</sup> Individual

<sup>51</sup> *Joint Implementation Land Use, Land-Use Change And Forestry Project Design Document Form*, Version 01, section A.4.4.

<sup>52</sup> The approved large scale methodology can be found at [http://cdm.unfccc.int/Panels/ar/032/ar\\_32\\_an01.pdf](http://cdm.unfccc.int/Panels/ar/032/ar_32_an01.pdf)

<sup>53</sup> UNFCCC Decision 16/CMP.1, Annex, para. 13.

<sup>54</sup> UNFCCC Decision 5/CMP.1, Annex, para 8.

A/R projects must meet the eligibility criteria submitted by the host country to the Executive Board, and demonstrate that the project is occurring on non-forested land *inter alia*.

See table 4 for a list of non-Annex I countries with significant mangroves that have submitted forest definitions for the purpose of the CDM.

**Table 4 Forest definitions for select non-Annex I countries**

Country	Minimum Crown Cover (10-30%)	Minimum land area (0.05-1ha)	Minimum tree height (2-5m)
<b>Indonesia</b>	Not submitted	Not submitted	Not submitted
<b>Brazil</b>	30%	1 ha	5 m
<b>Mexico</b>	30%	1 ha	4 m
<b>Nigeria</b>	Not submitted	Not submitted	Not submitted
<b>Malaysia</b>	30%	0.5 ha	5 m
<b>Myanmar</b>	10%	0.1 ha	2 m
<b>Papua New Guinea</b>	Not submitted	Not submitted	Not submitted
<b>Bangladesh</b>	Not submitted	Not submitted	Not submitted
<b>Cuba</b>	Not submitted	Not submitted	Not submitted
<b>India</b>	15%	0.05 ha	2 m
<b>Guinea Bissau</b>	Not submitted	Not submitted	Not submitted
<b>Mozambique</b>	Not submitted	Not submitted	Not submitted
<b>Madagascar</b>	30%	1 ha	5 m
<b>Philippines</b>	10%	0.5 ha	5 m

CDM A/R projects generate different credits to other CDM projects. To address the issue of permanence CDM A/R projects receive tCERs or ICERs. These credits are either re-issued or re-verified every 5 years respectively. They also expire at the end of a project's crediting period. If a tCER or ICER expires (either due to an un-favorable verification or the expiration of the crediting period) the buyer is required to replace the credit with another credit. Further, these credits are not eligible within the EU Emissions Trading Scheme. As a result tCERs and ICERs are viewed as high risk credits that attract low prices and very few CDM A/R projects have been developed or registered.

#### Assessment

Planting mangrove forests could be eligible under the CDM provided the project in question occurred on eligible land (i.e. land that was not a forest on 31 December 1989) and the mangrove met the country's definition of forest. Avoided emissions cannot be credited. For example, if the mangrove forest was planted on land that was previously mangrove and actively degrading and emitting GHGs from the soil, credits would not be issued for halting this degradation. Credits may, however, be awarded for accumulation of soil carbon as a result of the A/R activity though this is less significant.

There is one small scale CDM A/R methodology that covers degraded wetlands – AR-AMS0003, *Simplified baseline and monitoring methodology for small scale CDM afforestation and reforestation project activities implemented on wetlands*. The A/R project activities under this methodology are specifically restricted to the following wetland categories:

- Degraded intertidal wetlands (e.g. mangroves);
- Un-drained peat swamps that are degraded with respect to vegetation cover;

- Degraded flood plain areas on inorganic soils and
- Seasonally flooded areas on the margin of water bodies/reservoirs.

As a small scale methodology it is also limited to projects that are expected to generate no more than 16,000 tCO<sub>2</sub> per year and are developed or implemented by low-income communities and individuals.<sup>55</sup> There are no registered projects that use the methodology, though there are reports of a large scale mangrove A/R project currently being planned in Africa and Asia with support from Danone.<sup>56</sup>

A large scale methodology for A/R of degraded mangrove habitats has been recently developed and submitted to the CDM Executive Board for approval.<sup>57</sup> It has received approval by the CDM A/R Working Group and is awaiting final approval by the Executive Board.

Conservation or restoration of salt-marshes and sea grass beds and conservation of mangroves are not eligible under the current CDM rules. It should however be noted that the draft text leading up to the Meeting of the Parties of the Kyoto Protocol in Cancun in 2010 (CMP 6) included a number of options to reform the CDM. These included its expansion beyond A/R activities to also consider revegetation, forest management, wetland management, soil carbon management in agriculture, and other sustainable land management activities.<sup>58</sup> Ultimately though, these options did not form part of the final decision.

The current negotiating text, a revised proposal by the Chair of the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol (AWG-KP), retains the possibility of expanding the CDM in the second commitment period<sup>59</sup>, along with the possibility of requesting the SBSTA to “initiate a work program to consider, and, as appropriate, develop and recommend modalities and procedures for possible additional land use, land-use change and forestry activities under the clean development mechanism.”<sup>60</sup> No additional activities are specifically addressed in the text.

A specific CDM sectoral crediting mechanism was also discussed by parties under the AWG-KP during 2008 and 2009. The idea was to allow activities defined at the sectoral level to be registered as CDM projects and earn credits for emission reductions achieved below a sectoral baseline. However, in 2010, specific references to sectoral CDM in the AWG-KP negotiation text were dropped. These discussions lost traction, largely due to the opposition of some developing countries which were reluctant to discuss amendments to the Protocol that, in their view, would go beyond AWG-KP mandate.<sup>61</sup> The current AWG-KP negotiation text has only a placeholder referring to the possibility of voluntary proposals by developing countries of emissions thresholds for ‘broad segments of the economy’.<sup>62</sup>

In addition, given (i) the current stalemate in the negotiations for a second commitment of the Kyoto Protocol; (ii) the prominent role being attributed to NAMAs by both developed and developing countries under the Convention; and (iii) the fact that new market based mechanisms are being discussed under the Ad Hoc Working Group on Long-term Cooperative Action under the Convention (AWG-LCA), our analysis and recommendations on sectoral crediting mechanisms is placed in the context of the Convention only.

---

<sup>55</sup> UNFCCC Decision 5/CMP.1, Annex, para 1(i)

<sup>56</sup> See: <http://iucn.org/?7595/Mangroves-to-receive-huge-boost-from-new-carbon-credit-rules>.

<sup>57</sup> The approved large scale methodology can be found at [http://cdm.unfccc.int/Panels/ar/032/ar\\_32\\_an01.pdf](http://cdm.unfccc.int/Panels/ar/032/ar_32_an01.pdf)

<sup>58</sup> Climate Focus. 2011. CP16/CMP 6: The Cancun Agreements, Summary and Analysis. Available from: <http://climatefocus.com/documents/files/Cancun%20Briefing%20Jan%202011%20v.1.0.pdf>.

<sup>59</sup> FCCC/KP/AWG/2010/18/Add.1, Annex I, para 16.

<sup>60</sup> FCCC/KP/AWG/2010/18/Add.1, Chapter II, para 8.

<sup>61</sup> See Duan, M. “Reform of the Clean Development Mechanism: Where Should We Head For?”, available at: [http://www.ucl.ac.uk/laws/environment/docs/hong-kong/Reform\\_of\\_the\\_Clean\\_Development\\_Mechanism-DUAN\\_Maosheng.pdf](http://www.ucl.ac.uk/laws/environment/docs/hong-kong/Reform_of_the_Clean_Development_Mechanism-DUAN_Maosheng.pdf).

<sup>62</sup> See FCCC/KP/AWG/2010/CRP.4/Rev.4 available at <http://unfccc.int/resource/docs/2010/awg15/eng/crp04r04.pdf>.



The pursuit of a specific sectoral CDM mechanism covering blue carbon under the AWG-KP is therefore not suggested as priority action.<sup>63</sup>

## 5. Incentives for blue carbon mitigation under the UNFCCC

The UNFCCC is the overarching international climate change treaty that was ratified in 1992. The UNFCCC sets out the broad framework for addressing climate change. Unlike its Kyoto Protocol, the UNFCCC does not set quantified emission reduction limits or caps on any of its Parties and has not (yet) created any emissions trading programs under it (aside from the Kyoto Protocol). Another important difference between the UNFCCC and Kyoto Protocol is that the United States has ratified the UNFCCC, but not the Kyoto Protocol. As a result significant attention is given to the negotiations under the UNFCCC. This includes a number of important agenda items such as REDD+ and NAMAs.

### 5.1. Key Findings

- In the short term, developing blue carbon projects as nationally appropriate mitigation actions (NAMAs) is the most attractive option for raising the profile and international funding for mitigation activities in salt marshes, sea grasses and mangroves not fitting the definition of forest.
- Given current policy and technical uncertainties, initial NAMAs should focus on promoting blue carbon readiness, including data collection, studies on possible reference emission levels, measurement and reporting methods, and funding for the actual design of one or a set of blue carbon NAMAs. NAMAs focusing on implementation of demonstration projects and pilot policies and measures may also be possible in some countries with greater institutional and MRV capacities.
- Priority countries for NAMA implementation include Indonesia, Brazil, Mexico, and Malaysia. These countries already have national inventories that are comprehensive or in-process and specifically address blue carbon ecosystems in national policies and development plans. Countries that may most benefit from readiness efforts include Nigeria, Bangladesh, Cuba, India, Mozambique, Madagascar, Papua New Guinea and the Philippines.
- Mangroves fitting the definition of forest are likely to be more efficiently addressed and financed through REDD+. An international REDD+ mechanism was established in Cancun and guidance, modalities, procedures on MRV, reference levels and finance may progress faster than with NAMAs. There will also be an opportunity to expand the definition of REDD+ to include other LULUCF activities that could encompass other blue carbon ecosystems; such an expansion should be seen as voluntary for countries participating in REDD+.

### 5.2. Nationally Appropriate Mitigation Actions

#### Findings and Recommendations

Engaging developing countries with large mitigation potential in blue carbon ecosystems to develop capacity-building, blue carbon demonstration projects, and pilot policies and measures as NAMAs should be a priority. Most countries will likely need to focus on readiness activities to increase the country's understanding of emissions and removals from blue carbon sinks and reservoirs, the drivers of emissions, and what is needed to address these drivers and reduce emissions. Countries to prioritize blue readiness

---

<sup>63</sup> Interviews with outside experts have also confirmed the view that the negotiations on sectoral approaches and crediting are more likely to progress under the AWG-LCA, rather than under the AWG-KP.

activities may include: Nigeria, Bangladesh, Cuba, India, Mozambique, Madagascar, and the Philippines. Readiness activities could include:

- Data collection;
- Developing methodologies to monitor emissions, emission reductions, and removals;
- Assessing specific drivers leading to loss of coastal and marine ecosystems and
- Development of reference emissions levels for one or more types of blue carbon.

For those countries with greater institutional and MRV capacities, NAMAs combining both readiness and implementation activities (including demonstration projects and pilot policies and measures) could be pursued. Indonesia, Brazil, Mexico, and Malaysia have shown some potential for these types of NAMAs. Some of these countries may also be willing to consider sectoral approaches covering blue carbon types developed in the context of NAMAs.

Funds for blue carbon readiness and implementation of NAMAs could be accessed (or further mobilized) through a number of multilateral and bilateral initiatives currently providing fast-start finance (see section 8.2 on fast-start finance). NAMAs would probably best suit activities addressing salt marshes, sea grasses and those mangroves not fitting the definition of forest. Those mangroves fitting the definition of forest are likely to be more efficiently addressed and financed through REDD+ (see section 5.3 on REDD+).

Blue carbon readiness and implementation activities may eventually be proposed as a NAMA (or group of NAMAs) and be submitted to the UNFCCC secretariat. They may also be registered in an NAMA registry once this becomes operational. It should be possible to work with at least 2 or 3 countries to develop and submit blue carbon NAMAs for funding within 18 months.

### Background

The Bali Action Plan (BAP), adopted in 2007 at the Conference of the Parties (COP) 13, called for “nationally appropriate mitigation measures by developing country Parties in the context of sustainable development, supported and enabled by technology, financing and capacity building, in a measurable, reportable, and verifiable manner.”<sup>64</sup> NAMAs seek to expand developing country engagement beyond the project-based offset style to broader and more meaningful mitigation actions.

While there is no concrete definition of the concept of NAMAs, they are generally understood as voluntary mitigation actions by developing (Non-Annex I) countries in the context of sustainable development goals and which reduce emissions below business-as-usual. NAMAs may comprise a very diverse set of activities, ranging from capacity-building, to conventional command-and-control regulations, to sectoral and non-sectoral emissions trading schemes in developing countries. In the course of 2010, 43 submissions related to NAMAs were made by developing countries to the UNFCCC.

Whereas the scope and eligibility criteria of NAMAs have not yet been defined at the international level, there is consensus that NAMAs will be subject to performance-based standards in order to assess whether mitigation actions are actually taking place. The Cancun Agreements, agreed at COP 16 in Cancun, stated that domestically supported NAMAs would be measured, reported and verified (‘MRVed’) domestically (following internationally agreed upon guidelines), while internationally supported NAMAs would be subject to international MRV.<sup>65</sup> The Parties also agreed to establish a work program for the development of modalities and guidelines for, amongst others, the MRV of NAMAs.<sup>66</sup>

These provisions on MRV lead to the assumption that at least two categories of NAMAs will be designed and further refined under the Convention: unilateral NAMAs, being those implemented by developing countries with their own resources; and supported NAMAs, being those implemented with international

<sup>64</sup> UNFCCC Decision 1/CP.13, paragraph 1(b)(ii).

<sup>65</sup> UNFCCC Decision -/CP.16, paragraph 61 and 62.

<sup>66</sup> UNFCCC Decision 1/CP.16, paragraph 66.



multilateral or bilateral (financial) support. The new provisions agreed in Cancun on the creation of a registry to record NAMAs and to match these with international finance seem to further support this interpretation. Separate sections of the registry will record (i) NAMAs for which no international finance has been provided, and; (ii) NAMAs which have been matched with international support.<sup>67</sup> Parties are also considering the creation of another category of NAMAs which could be partly or in whole financed via the use of market-based approaches (referred to as market-based or crediting NAMAs). However, this remains a contentious point in negotiations under the Convention.

### Assessment

Annex I to this report provides a detailed overview of the work related to NAMAs that is currently being carried out in countries with significant blue carbon mitigation potential. It presents information associated with NAMAs already submitted to the UNFCCC secretariat, whether any specific reference is made to blue carbon or wetlands in general in these initial submissions, as well as relevant policies and measures being put in place by these countries.

It is important to note that the initial country submissions on NAMAs were very broadly defined, being difficult to distil any concrete set of activities, their intended scope and boundaries, finance required, and outcomes expected. In addition, the fact that some countries have already provided some level of information on their intended NAMAs, or have even specifically mentioned types of blue carbon, should not be seen as the only or main indicator of potential to develop blue carbon NAMAs and obtain support for these. The developments in international climate negotiations in the past three years seem to have consolidated a notion of NAMAs as an accounting framework for designing, proposing, measuring and obtaining finance for mitigation actions under the Convention. In December 2010 in Cancun the COP called upon those developing countries willing to implement NAMAs to (voluntarily) submit information to the UNFCCC Secretariat, including the amount of international finance sought, expected emissions reductions, and implementation timeframe. Countries like Nigeria, Malaysia, Bangladesh, and Mozambique which have not yet submitted any NAMA-related information, but have large mitigation potential in mangrove ecosystems<sup>68</sup>, may also become an opportunity for the development of blue carbon NAMAs. Other countries that have already submitted NAMAs may also make further submissions or refine their existing submissions.

Several countries already have national wetland inventories that are either comprehensive or under development and accompanied by national policies or development plans/strategies which specifically address blue carbon ecosystems. These countries, including Indonesia, Brazil, Mexico, and Malaysia, may already be in a position to implement demonstration and pilot activities for blue carbon emission reductions. Other countries have expressed interest in increasing capacity and in developing such inventories, and the NAMAs of these countries, including Nigeria, Bangladesh, Cuba, India, Mozambique, Madagascar, Papua New Guinea and the Philippines, could propose readiness efforts. See Annex I for supporting analysis and references.

### *Potential blue carbon NAMAs*

Mitigation actions addressing all three blue carbon types discussed in this paper could potentially be designed as a NAMA or set of NAMAs and eventually qualify for funding. While the concrete rules and modalities associated with NAMAs are pending, some general elements can be distilled:

- NAMAs should be appropriate for the national circumstances and development needs of the developing country;
- NAMAs should promote the country's sustainable development;

<sup>67</sup> UNFCCC Decision -/CP.16, paragraph 59.

<sup>68</sup> See Giri, C., Ochieng, E., Tieszen, L.L., Zhu, Z., Singh, A., Loveland, T., Masek, J., and Duke, N. 2011. Status and distribution of mangrove forests of the world using earth observation satellite data. *Global Ecology and Biogeography*, 20(2011): 154-159. (Giri et al. 2011).

In order of total mangrove area: Indonesia, Australia, Brazil, Mexico, Nigeria, Malaysia, Myanmar (Burma), Papua New Guinea, Bangladesh, Cuba, India, Guinea Bissau, Mozambique, Madagascar, Philippines.

- NAMAs can access developed country support (technology, finance, and capacity building); and
- NAMAs will be subject to MRV and recorded in a registry, which facilitates the matching of these activities with the finance, technology and capacity building available.

Apart from these general requirements, there seems to be little limitation as what could qualify as NAMAs.<sup>69</sup> This broad scope and definition allows NAMAs to be tailored specifically to each country's needs and mitigation potential. For instance, countries willing to address blue carbon emissions could seek NAMA finance initially for readiness activities, such as the elaboration of a blue carbon GHG inventory, mapping out the relevant carbon fluxes and stock changes from each type of blue carbon, and conducting an assessment that clearly defines local drivers of destruction or loss of carbon in coastal and marine ecosystems. This package of "readiness" NAMAs would allow countries to:

- Collect and process relevant data (including location of blue carbon, drivers, stock and emissions estimates, and national and local circumstances affecting emissions);
- Define similarities between the different blue carbon sinks and reservoirs that would justify these being addressed by similar national policies. Conversely, for some vegetation types like mangroves, it may be that local drivers are more similar to that of the forest sector (e.g. agriculture expansion and unsustainable forest management by riparian communities);
- Determine the type of policies most suitable to reverse the loss of blue carbon (e.g., conventional command-and-control, payment for ecosystem services, emissions trading);
- Strengthen methodologies to monitor emissions and emission reductions/removals from blue carbon sinks and reservoirs; and
- Assess the costs and benefits of constructing national or subnational blue carbon reference levels.

As the capacity to understand carbon fluxes and quantify emissions from blue carbon sinks and reservoirs grow, countries could move from readiness activities and start to implement and test the policies and measures (and MRV systems) they deem most efficient to tackle blue carbon emissions. Concrete policy interventions which could be designed as NAMAs include the creation of coastal preservation areas, measures of flooding and dam control, and the promotion of sustainable aquaculture. Other more community-focused interventions could include promotion of sustainable alternative livelihoods for communities based in vulnerable blue carbon ecosystems, and promoting community participation in integrated coastal resources management. The right set of policies and measures may differ for the different types of blue carbon, depending on the relevant drivers affecting each type of vegetation or ecosystem.

Several countries, including Indonesia, Brazil, and Mexico, likely already have the capacity to move beyond readiness toward implementation. For instance, Indonesia has already developed several national strategies for the sustainable management of wetlands, including the National Strategy and Action Plan for Wetland Management and the National Strategy on Management of Mangrove Ecosystems. Additional strategies exist for incorporating wetlands in sustainable development and poverty alleviation, and they have already developed a comprehensive national wetland inventory. Mangrove and coastal rehabilitation programs have already been conducted in several locations. While Brazil does not yet have a national wetland policy, wetlands are included in several other national policies and a national inventory exists. Additionally, a Global Environment Facility (GEF) project has been approved for the conservation and sustainable management of 568,000 hectares of mangroves in Brazil. The project is designed to further improve

---

<sup>69</sup> Questions may arise as to whether sea grasses (being found in marine ecosystems) could be covered within the framework of NAMAs. Our position is that there is currently no such limitation on the potential coverage of NAMAs. In addition, the Convention explicitly refers to the role and importance of GHG sinks and reservoirs in marine ecosystems and imposes a general obligation on all parties to promote sustainable management, conservation and enhancement of sinks and reservoirs in marine ecosystems (see Preamble and Article 4.1(d) of the Convention). However, the lack of IPCC definitions and guidance for marine ecosystems will make it more difficult for MRVing emissions and emission reductions from these activities and probably dedicated MRV procedures would need to be elaborated for sea grass-related activities.





institutional capacities and test finance strategies.<sup>70</sup> Like Brazil, Mexico is already well underway in the creation of a comprehensive national wetland inventory, and is developing a national strategy for the care of coastal wetlands. Wetlands are also included in other high-level national policies, and a mangrove monitoring program has been established. Moreover, a recent review of Mexico's MRV capacity found few major gaps or barriers.<sup>71</sup>

All these measures could in principle be formulated as single or a set of NAMAs. At a minimum any NAMA should provide a clear description of the policy and/or measures being implemented, their expected mitigation impact (including an emissions reduction estimate), the amount of international finance that is being sought, and the anticipated time frame for implementation. These NAMAs could be communicated by the country to the UNFCCC secretariat and recorded in the NAMA registry (once operational).

#### *MRV and financing aspects*

The extent to which countries will be able to benefit from international support will largely be a function of their ability to implement robust and credible monitoring and GHG inventory systems. Although detailed modalities and procedures for such monitoring systems are yet to be defined, current practice has shown that these do not need to be expressed solely on the basis of tonnes of carbon dioxide reduced or avoided, but may also be based on the use of conservatively estimated proxies and qualitative requirements.<sup>72</sup> This is particularly the case where countries are still in the stage of building comprehensive monitoring and reporting systems which allow for detailed measurement of emissions and emission reductions in the different sectors.

Mitigation actions addressing blue carbon sinks and reservoirs could potentially be eligible for financing under both publicly supported ('fund-based') as well as, if ever adopted, market-based NAMAs. With respect to fund-based support, the Green Climate Fund (GCF) established in Cancun is expected to play an important role in financing NAMAs after 2012. The GCF will operate as a fund-based mechanism and will support "projects, programmes, policies, and other activities" in developing countries using specific thematic windows.<sup>73</sup> A functional link is to be established between the GCF and the NAMA registry,<sup>74</sup> which indicates that mitigation finance will target actions of a much broader scope, such as regional, sectoral and sub-sectoral measures. The number and design of the thematic windows are still under negotiation. The negotiation text going into Cancun listed REDD+, CCS, technology transfer, and adaptation as bracketed options, but these were not explicitly mentioned in the final decision adopted at Cancun so this is still open to future negotiation.

The operational rules, eligibility criteria and financial instruments to be adopted by the GCF are also under discussion. The GCF could fund initiatives directly (similar to the Global Environment Fund), act as a broad fund allocation mechanism (i.e. that allocated funds at a high level to other entities that make decisions on individual activities funded), or some combination of both. Irrespective of the method, at some point, performance evaluation instruments will be used to assess results and progress of supported activities. The link between the GCF and NAMAs suggests that this performance evaluation may be tied to the international MRV modalities agreed upon by the COP. This is particularly sensitive for international public

<sup>70</sup> GEF. Effective Conservation and Sustainable Use of Mangrove Ecosystems in Brazil. Project documents available from: <http://gefonline.org/projectDetailsSQL.cfm?projID=2703>.

<sup>71</sup> Euroconsult Mott MacDonald. 2010. Developing countries, monitoring and reporting on greenhouse gas emissions, policies and measures: Country Report Mexico. Available from: [http://ec.europa.eu/clima/studies/g-gas/docs/country\\_report\\_mexico\\_2010\\_en.pdf](http://ec.europa.eu/clima/studies/g-gas/docs/country_report_mexico_2010_en.pdf).

<sup>72</sup> As an illustration, the Brazilian Amazon Carbon Fund, which receives international funding to support actions for the prevention and control of deforestation at the national level, makes use of a number of performance indicators. The performance of the Fund is assessed on the basis of annual deforestation rates and a conservative estimate of the carbon content per hectare (100 tC/ha). The performance of the projects supported by the Fund, in turn, are monitored through indicators such as number of granted authorizations and environmental licenses, volume of resources applied, volume of areas monitored, number of environmental authority outposts created, amongst others. Similarly, MRV procedures for blue carbon NAMAs could be based on the use of proxies.

<sup>73</sup> UNFCCC Decision 1/CP.16, para. 102.

<sup>74</sup> UNFCCC Decision 1/CP.16, para. 57.



funding, where resources are rather limited and need to be employed where their mitigation results can be most optimized.

When market-based NAMAs are considered, the requirements for crediting are likely to be less flexible. The basic premise for the existence of a GHG market is the establishment of a rigorous, accurate and transparent monitoring and accounting of net emission reductions that can assure the environmental integrity of the system and avoid double counting of units created. Moreover, a monitoring system shall be able to continuously improve the accuracy of data used for estimating carbon stock changes and other emissions. Below we discuss some of the concepts and notions of crediting which could be applied in the context of blue carbon market-based NAMAs, stressing however that sectoral crediting mechanisms (within or outside the NAMA context) are still under discussion and remain a contentious point among parties.

#### *Sectoral approaches and crediting*

Sectoral approaches and crediting mechanisms are being discussed largely under the Convention, but also have a placeholder in the Kyoto Protocol discussions.<sup>75</sup> There is a specific agenda item on new mechanisms under the Long-term Cooperative Action under the Convention (LCA), which includes discussions on sectoral crediting mechanisms. Sectoral approaches may also include sector-specific fund-based NAMAs. Some also consider REDD+ a type of sectoral crediting.

Sectoral approaches were initially proposed as a separate category (outside of the NAMA framework) as a manner to enhance contributions by developing countries, create access to carbon markets and assist developed countries in complying with their quantified GHG targets.<sup>76</sup> Sectoral approaches would allow developing countries to voluntarily advance sectoral GHG-targets (or reference levels) and be eligible to receive credits for reductions achieved beyond the proposed (no-lose) sector-target.<sup>77</sup> With the notion of NAMAs becoming more consolidated in the last couple of years, proposals for sector-based approaches and crediting mechanisms started being integrated into the NAMA discussions, as well as into a broader negotiation on new market-based mechanisms as complementary means of support for NAMAs. More recently, a number of countries have made submissions that include linking or combining existing or new market-based instruments with NAMAs.<sup>78</sup> According to these proposals, issuance of credits for measured, reported, and verified NAMAs would be possible once a monitoring system is in place and subject to strict environmental integrity requirements.

If NAMAs included market based mechanisms, they would need to comply with the general criteria already agreed by parties and laid down in the Cancun Agreements:

- ensure voluntary participation, with fair and equitable access to all parties;
- complement other means of supporting NAMAs;
- stimulate mitigation across broad segments of the economy;
- safeguard environmental integrity;
- ensure a decrease in net emissions;
- ensure instruments are supplemental to domestic actions; and

---

<sup>75</sup> For the Kyoto Protocol, see document FCCC/KP/AWG/2010/CRP.4/Rev.4 available at <http://unfccc.int/resource/docs/2010/awg15/eng/crp04r04.pdf>.

<sup>76</sup> See AWG-KP non-paper from its eighth session available at [http://unfccc.int/files/kyoto\\_protocol/application/pdf/revised\\_non-paper\\_consolidated\\_100609\\_1000.pdf](http://unfccc.int/files/kyoto_protocol/application/pdf/revised_non-paper_consolidated_100609_1000.pdf).

<sup>77</sup> Schmidt, J., Helme, N., Lee, J., and M. Houdashelt. 2006. Sector-based Approach to the Post-2012 Climate Change Policy Architecture. Future Actions Dialogue Working Paper, Center for Clean Air Policy, Washington, DC.; and Ward, M., Streck, C., Winkler, H., Jung, M., Hagemann, M., Hohne, N., and R. O'Sullivan. 2008. The Role of Sector No-Lose Targets in Scaling up Finance for Climate Change Mitigation Activities in Developing Countries. Available from: <http://www.climatefocus.com>.

<sup>78</sup> See submissions from Australia, Papua New Guinea, Peru and South Korea, available at <http://unfccc.int/resource/docs/2011/awglca14/eng/misc02.pdf>; See also non-paper of the AWG-KP at its ninth session available at [http://unfccc.int/meetings/ad\\_hoc\\_working\\_groups/kp/items/4920.php](http://unfccc.int/meetings/ad_hoc_working_groups/kp/items/4920.php).

- ensure good governance and robust market functioning and regulation.<sup>79</sup>

No explicit consideration has been given so far at the international level to a sectoral crediting approach that would target specifically blue carbon emissions. However, this type of sectoral crediting approach in coastal areas could in theory be proposed by a country (or group of countries) if relevant to them. This sectoral blue carbon NAMA mechanism could be designed along the lines of the design, modalities and rules currently being discussed for REDD+. It could include the construction of a sectoral reference level addressing emissions and removals from internationally agreed blue carbon mitigation activities. Potential accounting overlaps with REDD+ (e.g. mangrove forests) would need to be addressed from the beginning.

Although the link between REDD+ and NAMAs remains unclear, REDD+ is often considered as an example of a sector-based approach that is currently supported by readiness and pilot performance-based funding mechanisms, which may in theory eventually involve crediting of emissions reductions and removals. Other specific sectoral approaches being negotiated include emissions from bunker fuels and agriculture.

A blue carbon sectoral approach could also follow the phased-approach adopted for REDD+, which moves from the readiness phase discussed above to the last phase involving payments and/or crediting for results-based activities – so long as emission reductions and removals can be estimated with sufficient certainty.<sup>80</sup>

Papua New Guinea (PNG), one of the early champions for REDD under the UNFCCC and a country with considerable mitigation/adaptation potential in marine and coastal ecosystems, has put forward one of the most detailed proposals on crediting of NAMAs so far. PNG considers that market-based NAMAs could be established both top-down (created and defined under the UNFCCC) and bottom-up (proposed by countries, but meeting internationally pre-agreed criteria). Mexico, Peru, and Australia are also in favor of market based crediting under NAMAs. Parties willing to make use of market-based NAMAs would do so voluntarily and be able to choose from a portfolio of options or develop market-based mechanisms that best suits its national circumstances and preferences.<sup>81</sup> The bottom-up approach mechanism is more in line with recent developments in international climate change negotiations, which seems to be leaning towards a pledge and review system, as opposed to a Kyoto-style top-down structure (see Text Box 1 below).

Finally, it is worth noting that the link between NAMAs and REDD+ has not been clarified yet under the UNFCCC. So far, the COP has only stated that modalities to be developed by SBSTA for 'MRVing' REDD+ activities must be consistent with any guidance on MRV associated with NAMAs.<sup>82</sup> Hence, some blue carbon types may be addressed under the general framework of NAMAs (such as salt marshes and sea grasses), while others like some mangroves may fit under the current REDD+ mechanism without major changes to current definitions or criteria.

#### Text Box 1 Overview of pledge and review system

While the Kyoto Protocol established top-down binding quantitative reduction targets for each Annex I party, the negotiations during the Copenhagen Accord and the Cancun Agreements have shown that parties are increasingly perceiving a pledge and review system as a more politically palatable option, in particular to include both the US and China in a comprehensive new climate agreement. Countries like Japan, Canada and Russia have also re-affirmed their unwillingness to remain as parties to the Kyoto Protocol. The pledge and review system may have a detrimental effect on carbon markets if bottom-up pledges result in weaker reduction commitments and hence less demand for offsets. In addition, if a pledge and review system is established within a non-binding international framework, it may also lead to regulatory uncertainty in the medium to long-term and thus reduce private sector engagement.

<sup>79</sup> UNFCCC Decision 1/CP.16 para 80.

<sup>80</sup> While it is still uncertain whether REDD+ credits will be generated at the international level, discussions on the creation of REDD+ units, at least at the subnational level and voluntary level, are advancing (see discussions on REDD+ below).

<sup>81</sup> See PNG submission at <http://unfccc.int/resource/docs/2011/awglca14/eng/misc02.pdf>.

<sup>82</sup> See Appendix II of UNFCCC Decision 1/CP.16.



However, under a pledge and review system, emissions trading as a domestic or regional policy does not come to an end. Countries remain free to design their own market-based policies and enter into bilateral and/or multilateral agreements to recognized units and offsets from other countries (as with the case of the EU Emissions Trading Scheme and Japan's bilateral process to recognized foreign offsets). In addition, in the Cancun Agreements, parties agreed that developed country commitments should include quantified economy-wide emission reductions. Pledges made by countries will likely be translated into GHG targets, following a procedure that ensures comparability among pledges submitted (considering differences in base years, emissions trajectories, and the use of LULUCF, amongst others). This leaves the option for international emissions trading still open. Furthermore, one of the proposals for new market-based mechanisms that seem to be gaining traction is the establishment of an international framework within which new national or bilateral market-based mechanisms would be established. Under this common framework, the COP may be tasked with harmonizing methods for determining reference levels, provide guidance on the accounting of units and credits, and facilitate the bridge among different mechanisms and registries.<sup>83</sup>

### 5.3. Reduced Emissions from Deforestation and Forest Degradation (REDD+)

#### Findings and Recommendations

Mangroves that meet the definition of a forest will fall under REDD+. Support for mangroves can therefore fall under REDD+ 'readiness' activities and fast-start finance in countries with significant mangrove ecosystems. Accessing this should be a priority. Support for REDD+ readiness should be directed towards readiness activities such as improving data on mangrove carbon and drivers of deforestation and degradation of mangroves. MRV of emissions and removals in mangrove ecosystems should be fed into the country's readiness process, in particular the implications in the construction of national and/or subnational REDD+ reference levels.

As the eligibility for mangroves under REDD+ rests on a country's definition of forest, additional work is needed to raise awareness amongst developing countries of the implications of the definition of forest with respect to mangroves. This should include support for developing countries' and accredited observers' participation in SBSTA meetings dealing with modalities and procedures for REDD+, including determining forest reference levels and reference emission levels.

Finally, an effort could be launched to ensure blue carbon is included in anticipated SBSTA discussions that will consider a broader set of LULUCF actions that can contribute to climate change mitigation.

#### Background

At COP 16 in December 2010 Parties to the UNFCCC officially recognized and encouraged developing country contributions to mitigation actions in the forest sector through: (i) reducing emissions from deforestation; (ii) reducing emissions from forest degradation; (iii) conservation of forest carbon stocks; (iv) sustainable management of forest; and (v) enhancement of forest carbon stocks.

While the COP 16 decision limited REDD+ to these five activities, it also requested the SBSTA to identify LULUCF activities in developing countries, related methodological issues around estimating emissions and removals, and to assess the "potential contribution" to the mitigation of climate change from these additional activities.<sup>84</sup> A report on the findings and outcomes of this issue are due to the COP at its eighteenth session (i.e. December 2012).

The COP 16 decision also confirmed the notion that REDD+ should be implemented through phases, beginning with the development of national strategies or action plans; followed by the implementation of policies and measures that could involve further capacity-building, technology development and transfer;

<sup>83</sup> See the Secretariat's Synthesis report on information on various approaches in enhancing the cost-effectiveness of, and promoting, mitigation actions, available at <http://unfccc.int/resource/docs/2011/awglca14/eng/04.pdf>.

<sup>84</sup> UNFCCC, Decision 1/CP.16, Appendix II, paragraph (a).



and evolving into results-based actions that should be fully 'MRVed'. While there is no reference to sources of financial support (either government or market-based, which was left for COP 17), there is a mandate to explore financing options for the full implementation of the results-based actions (phase III).

Outside the UNFCCC, the Scientific and Technical Review Panel (STRP) of the Ramsar Convention established in 2006 a thematic working area dedicated to assess the role of wetlands in climate change mitigation and adaptation, with one of the focus being on the implications of REDD+ for wetlands.<sup>85</sup> In addition, in March 2011, an international forum celebrating the 40<sup>th</sup> anniversary of the Ramsar Convention produced a declaration stating, amongst others, the need for the creation of new funding mechanisms for wetland conservations, including the inclusion of wetlands under REDD+.<sup>86</sup>

### Assessment

The degree to which blue carbon sinks and reservoirs can be included under a REDD+ mechanism will depend on whether the relevant blue carbon sinks and reservoirs fit within the definition of eligible activities (current or revised). There are two possible dimensions to including blue carbon in REDD+: (i) consideration of mangroves that meet the current agreed scope of activities under REDD+ and (ii) launching an effort to expand the current scope of REDD+ to include a broader set of LULUCF categories that include blue carbon ecosystems.

#### *Mangroves Considered as Forests under REDD+*

Given that salt marshes and sea grass beds are clearly non-forested vegetation types, it is likely that only mangrove forests could be included under REDD+, as currently defined. Provided that the relevant mangrove land-area, cover and height fits the definition of forest adopted by a country, these vegetation types would be able to be considered under REDD+ activities and be eligible for REDD+ related finance. It is possible that countries could opt to re-visit their current definition of forest so as to apply lower thresholds than those used for the purposes of the Kyoto Protocol to increase the amount of forest area eligible for REDD+ finance in the country. These changes may create further opportunities for the inclusion of mangroves under REDD+.

For those mangrove areas meeting the definition of forest, there is potential for including both their above ground biomass and soil carbon in a national or subnational REDD+ accounting framework. Accounting for soil may prove problematic. In Tier 1 and simple 2 methods for examining soil carbon (over half of the carbon stock in mangroves), stocks are only computed to a depth of 30 cm in mineral soils (although greater depths can be selected at Tier 2 if data are available), and in organic soils, they are based on emission factors.<sup>87</sup> Tier 3 methods can refine estimates in both soil types.

The guidance as written to date poses two key challenges for accounting for soil carbon from mangroves. Foremost, accounting would be limited by the lack of datasets existing for all tiers,<sup>88</sup> especially organic soil emission factors. Moreover, the Tier 1 default depth of 30 cm is not designed for mangroves and is too shallow to fully account stocks, so a minimum of Tier 2 methodologies would need to be applied to obtain full credit. This has the potential to exceed the capacity of many developing nations in the near term.

The inclusion of mangroves (and particularly soil carbon in mangroves) into REDD+ will affect the development of reference levels and monitoring systems. The Cancun decision encouraged developing

---

<sup>85</sup> The Ramsar Convention is the principal international agreement on wetlands and wetland conservation. Ramsar defines wetlands as: "areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters." The Ramsar Convention does not, however, focus on GHG emissions and emission reductions.

<sup>86</sup> See Tehran Declaration on Wetlands and Sustainable Development, available at [http://www.ramsar.org/pdf/ramsar\\_40/Tehran\\_Declaration%202011.pdf](http://www.ramsar.org/pdf/ramsar_40/Tehran_Declaration%202011.pdf).

<sup>87</sup> IPCC 2006. Vol. 4, Chapter 2, *supranote* 21.

<sup>88</sup> Crooks et al. 2011, *supranote* 10.



countries aiming to participate in REDD+ to develop, amongst others, “a national forest reference emission level and/or forest reference level or, if appropriate, as an interim measure, subnational forest reference emission levels and/or forest reference levels, in accordance with national circumstances, and with provisions contained in decision 4/CP.15, and with any further elaboration of those provisions adopted by the Conference of the Parties”<sup>89</sup>.

The reference to the methodological guidance provided by Decision 4/CP15, in Copenhagen, is important for the establishment of forest reference levels and forest reference emission levels. This decision requested developing country Parties to:

- “identify activities within the country that result in reduced emissions and increased removals, and stabilization of forest carbon stocks”; and
- “use the most recent Intergovernmental Panel on Climate Change guidance and guidelines (...) as a basis for estimating anthropogenic forest-related greenhouse gas emissions by sources and removals by sinks, forest carbon stocks and forest area changes”.

Thus, while recognizing that further work needs to be conducted by the IPCC, decision 4/CP.15 called on developing country Parties to identify the activities within the country boundaries that lead to a reduction in emissions, increase in removals or stabilization of forest carbon stocks, using, as appropriate, the 2006 IPCC Guidelines and the 2003 GPG-LULUCF. This should include some mangroves that meet a definition of forest. It will also leave out emissions from mangroves that are not classified as forests, unless the scope of REDD+ is expanded in the future to include a broader set of LULUCF categories and activities.

The difficulties in reporting and accounting, however, do not preclude the inclusion of mangroves in a REDD+ system. The phased-approach design of REDD+ allows countries to seek technical and financial support for REDD+ activities in accordance with their national circumstances and capabilities. This means that, for those countries with high mitigation potential associated with the protection of mangroves, assistance and finance could be sought, for instance, to include this type of vegetation in the elaboration of the country’s national reference level and MRV requirements. Meanwhile, the IPCC could be called on to develop further guidance, factors and default rates for these vegetation types.

In addition, under the thematic working area for wetlands and climate change of the Ramsar Convention, the STRP agreed to find ways to connect further with the UNFCCC and the IPCC. This included suggestions made by participants for stronger lobbying under the UNFCCC and for the STRP to work on the Ramsar Secretariat nominations for the IPCC 5<sup>th</sup> Assessment Report.<sup>90</sup>

#### *Expanding the Scope of REDD+*

In Cancun, countries agreed to limit REDD+ to forest-related activities. Preceding discussions, however, did include consideration of whether a broader LULUCF (or AFOLU) approach would make sense. However, in the end countries decided that forests represented the more immediate mitigation opportunity and many questioned if taking a broader approach would overly complicate the REDD+ agenda.

Over the next 18 months, however, SBSTA discussions on REDD+ will include consideration of a broader set of LULUCF activities that can contribute to climate change mitigation<sup>91</sup>. A report on this issue will be presented by the SBSTA to COP 18 in December 2012. While the SBSTA mandate suggests the focus will be “in particular, on [LULUCF activities that are] drivers of deforestation”, there is an opportunity to include in the debate activities that seek to conserve blue carbon ecosystems. This would require a coalition of like-minded countries to press for inclusion of these activities in the discussions on this agenda item.

<sup>89</sup> UNFCCC Decision 1/CP.16 (III.C. 71).

<sup>90</sup> See report of Mid-term workshops of the Scientific & Technical Review Panel (STRP), February 2010, available at [http://www.ramsar.org/pdf/strp/strp\\_workshop2010\\_report.pdf](http://www.ramsar.org/pdf/strp/strp_workshop2010_report.pdf).

<sup>91</sup> UNFCCC Decision 1/CP.16 (Appendix 2).



There are several countries and NGOs that take an interest in expanding REDD+ beyond forest-only activities. For example, Wetlands International is pressing for the inclusion of peatlands. Indonesia, at one time, also supported a LULUCF approach given its large mitigation potential in peatlands. Africa, up to COP 14 in Copenhagen, also supported a LULUCF approach—given potential mitigation opportunities in agriculture—but in the end decided it was not clear whether it was in their interests to broaden the scope of REDD+ at this time. The United States, for technical reasons, also supports a broader AFOLU approach.

If such an effort was launched, it would be more politically palatable if new categories/activities being considered were completely voluntary for countries participating in REDD+. In other words, it would allow a country such as Indonesia to include peatlands in their REDD+ efforts, but not obligate others to do so.

#### *REDD+ financing*

REDD+ readiness funding is currently flowing from bilateral and multilateral development agencies, and international NGOs. Many studies and demonstration projects involving restoration and conservation of mangrove ecosystems, sustainable aquaculture activities, and reversal of degradation trends are already taking place in Indonesia, Thailand, and Sri Lanka. Funding is being provided, for instance, by programs and initiatives in the US, Australia, Sweden and by organizations like Mangroves for the Future, to name a few (see section 8.2 below on fast-start finance). In addition, the GCF may have a thematic window for REDD+ as well as for adaptation and, once operational, may become an important source of finance to mitigation and adaptation actions in coastal areas after 2012.

Finally, the implementation of subnational REDD+ activities may also provide an entry point for the accounting and financing of mangrove-forest protection. In Cancun, the parties to the UNFCCC established that REDD+ may be implemented at a subnational scale, including the creation of monitoring and reporting systems as an interim measure before scaling up to a national framework. This indicates that countries may start out by implementing subnational actions, which may also include incentives for subnational-level activities (for those countries favoring a subnational approach).

While it remains uncertain whether support for program-level activities would come from international REDD+ finance or through governments, and whether such support could be in the form of payments and/or carbon credits, the possibility exists for the recognition by governments of REDD+ projects in mangrove-forest areas. These projects could, for instance, be designed as pilots to test the measurement and monitoring of emissions and removals related to deforestation of mangroves and conservation activities. The overlapping mitigation and adaptation benefits of mangrove conservation and restoration activities should make this type of activity particularly attractive for international funding.

## 6. Options for blue carbon under regional and domestic trading schemes

The international climate change law and policy is complemented by regional and national laws and policies in many countries. The EU, for example, has established an EU wide emissions trading scheme that has created significant demand for offset credits generated under the CDM. Other states and countries such as California and Australia are considering developing similar programs. All of these trading schemes represent a potential source of finance for projects in blue carbon ecosystems, so long as projects that protect or restore blue carbon sinks or reservoirs are recognized and there is sufficient demand for the credits they may generate.



## 6.1. Key Findings

- Australia is currently developing a domestic Carbon Farming Initiative to supply domestic offsets for the domestic voluntary market and a future domestic compliance market – if it is ever developed. The current draft of the Carbon Farming Initiative is sufficiently broad to already cover most if not all blue carbon ecosystems. The initiative is currently reviewing methodologies, and existing efforts to develop blue carbon methodologies for submission to the initiative could be supported.
- The EU ETS will not include offsets from blue carbon sources in the short to medium term. However, there are opportunities to gain funding from auction revenues.
- The EU Effort Sharing Decision allows countries to purchase tCERs and ICERs from CDM A/R projects in least developed countries and small island developing states. A selection of Member States should be approached to generate demand for credits from mangrove A/R projects.
- California may in theory recognize some mangrove forest projects in the US, but the relevant protocols do not include soil carbon. Salt marshes, sea grasses, and non-forest mangroves are not recognized. Demand from California is expected to be limited and any blue carbon offsets would need to compete with REDD+.

## 6.2. Australia

### Findings and Recommendations

The current draft legislation supporting the Carbon Farming Initiative (CFI) is sufficiently broad to already include blue carbon ecosystems. However, as it is not on the radar of the government stakeholders engaged in this area, inclusion of blue carbon ecosystems in the legislation should be supported. This could include supporting the development of methodologies for blue carbon for the CFI along with raising awareness within the government directly. While Australian blue carbon ecosystems likely currently enjoy greater protection than other blue carbon ecosystems in developing countries, inclusion within the Australian system will help build knowledge and demonstrate proof of concept that is transferrable to larger markets, though demand within Australia itself is not expected to be significant.

Australia is considering a national emissions trading scheme but draft legislation has not yet been released. This legislation should be reviewed when it is available to determine what, if any, interventions may be appropriate in the future.

### Background

Australia has salt marshes, extensive areas of sea grasses<sup>92</sup> and almost 1 million ha or 7.1% of the world's mangroves, placing it second in the world in mangroves after Indonesia with over 3 million ha/22.6%.<sup>93</sup> Australia is currently developing a domestic offset scheme – the Carbon Farming Initiative (CFI) - that may extend to blue carbon ecosystems and create market incentives to protect domestic sources of blue carbon emissions.

Australia is also contemplating a national emissions trading scheme that may allow for importing international offsets, making Australia a potential source of demand for international credits. Finally, including blue carbon ecosystems within Annex I accounting under the Kyoto Protocol may be important for Australia. This makes Australia particularly relevant when reviewing policy forums relevant to blue carbon.

---

<sup>92</sup> Estimated at 510,000 ha in 1997. See Kirkman, H. 1997, *Seagrasses of Australia*, Australia: State of the Environment Technical Paper Series (Estuaries and the Sea), Department of the Environment, Canberra.

<sup>93</sup> See Giri et al. 2011, *supranote* 71.



## Assessment

### *Carbon Farming Initiative (CFI)*

The CFI is being promoted as a “carbon offset scheme... to provide new economic opportunities for farmers, forest growers and landholder and help the environment by reducing carbon pollution”.<sup>94</sup> The legislation underpinning the CFI<sup>95</sup> was introduced to Parliament on 24<sup>th</sup> March 2011 where it passed its first reading and was referred to the Senate Environment and Communications Legislation Committee for review. The Committee report was due back to the Senate on 20<sup>th</sup> May 2011. The analysis in this report is based on the original bill as introduced. The CFI is reported to have bi-partisan support within the current House and Senate but it is not guaranteed to become law and amendments may still be introduced.<sup>96</sup>

As introduced the CFI bill has three objectives; i) implement certain obligations that Australia has under the UNFCCC and Kyoto Protocol; ii) create incentives for people to carry on certain offsets projects; and iii) increase carbon abatement in a manner that is consistent with the protection of Australia’s natural environment and improves resilience to the effects of climate change.<sup>97</sup> To meet these objectives the CFI recognizes a number of different types of projects that are able to generate Australian carbon credit units. The types of recognized projects are divided into “emission avoidance offset projects” and “sequestration offset projects”, each of which can also be divided into “Kyoto offset projects” and “non-Kyoto offsets projects”. These projects can generate both “Kyoto Australian carbon credit units” and “non-Kyoto Australian carbon credit units”.

Sequestration offset projects are defined as a project:

- “(a) to remove carbon dioxide from the atmosphere by sequestering carbon in one or more of the following:
  - (i) living biomass;
  - (ii) dead organic matter;
  - (iii) soil; or
  
- (b) to remove carbon dioxide from the atmosphere by sequestering carbon in, and to avoid emissions of greenhouses gases from, one or more of the following:
  - (i) living biomass;
  - (ii) dead organic matter;
  - (iii) soil.”<sup>98</sup>

“Kyoto offset projects” are essentially defined as projects that remove or avoid emissions that are eligible by Australia for compliance under the Kyoto Protocol or an international agreement (if any) that is a successor to the Kyoto Protocol.<sup>99</sup> These offset projects can generate “Kyoto Australian carbon credit units”<sup>100</sup> which in turn can be exchanged for AAUs, RMUs, or ERUs as appropriate.<sup>101</sup> Non-Kyoto offset projects generate “non-Kyoto Australian carbon credit units”<sup>102</sup> that do not appear to be exchangeable for Kyoto units.

The definition of sequestration offset project is very broad and may already encompass emission reductions or removals from blue carbon ecosystems including above ground biomass and soil carbon. The broad inclusion of “soil” as one of the criteria of a sequestration offset project may extend to sea grasses.<sup>103</sup> The

<sup>94</sup> See <http://www.climatechange.gov.au/cfi>.

<sup>95</sup> *Carbon Credits (Carbon Farming Initiative) Bill 2011*.

<sup>96</sup> The current Senate is due to change on 1<sup>st</sup> July as a result of the 2010 federal elections.

<sup>97</sup> *Carbon Credits (Carbon Farming Initiative) Bill 2011*, Section 3.

<sup>98</sup> *Carbon Credits (Carbon Farming Initiative) Bill 2011*, Section 54.

<sup>99</sup> *Carbon Credits (Carbon Farming Initiative) Bill 2011*, Section 55.

<sup>100</sup> *Carbon Credits (Carbon Farming Initiative) Bill 2011*, Section 11.

<sup>101</sup> *Carbon Credits (Carbon Farming Initiative) Bill 2011*, Section 157.

<sup>102</sup> *Carbon Credits (Carbon Farming Initiative) Bill 2011*, Section 11.

<sup>103</sup> Soil is not defined in the legislation, though the legislation does often refer to agricultural soils on other sections. Without a clear definition in the legislation other sources for interpreting soil need to be identified. “Soil” not clearly

publicly stated purpose of the CFI to support “farmers, forest growers and landholders”, which does not on its face extend to areas such as sea grasses. As a result the broad interpretation of “soil” as extending to marine soil will need to be tested against the potential for a narrower interpretation.

Blue carbon projects that fall under Australia’s Kyoto Protocol accounting under article 3.4 and generate emission reductions or removals may also be eligible to receive Kyoto units, though this would be limited to mangrove forests and the exact mechanism for this is unclear (see the discussion on JI above).

Assuming blue carbon is technically eligible under the CFI, in order to generate offsets there needs to be an approved methodology. Methodologies may be developed by government departments and private proponents and submitted for approval. The Department of Climate Change and Energy Efficiency and the Department of Agriculture, Fisheries and Forestry are currently developing offset methodologies. This work is being progressed through a number of methodology work streams, including:

- Reforestation, forest management and avoided deforestation;
- Savanna fire management;
- Landfill gas recovery;
- Manure management;
- Management of methane from livestock; and
- Soil carbon and biochar.<sup>104</sup>

Methodologies are approved by the Minister for Climate Change and Energy Efficiency after review by and on the recommendation of the Domestic Offsets Integrity Committee.<sup>105</sup>

The methodology development and approval process is meant to be an inclusive process that is open to any project developers and a wide range of project categories. This does not seem to be the case in practice. There is an expectation that priority will be given to methodologies developed by Government departments and stakeholder consultation on this process has been regarded by some developers as cursory and disingenuous. Blue carbon is also outside the current radar of the Government and the Domestic Offset Integrity Committee. It is expected to remain on the periphery in the immediate future due to i) uncertainty on some of the science; ii) falling outside the Governments current priority list; and iii) a lack of stakeholder pressure to change this.<sup>106</sup> Of the 278 submissions to the government on the CFI only 2 were related to blue carbon ecosystems – one from Wetland Care Australia (a non-profit) and the other from Ocean Nourishment (a private company also advocating sequestration via ocean fertilization).

#### *Future National Emission Reduction Legislation*

National legislation to introduce a national cap and trade scheme was defeated twice in 2010 and led to significant political turmoil in Australia, including a change in leadership of the current ruling Labor party. An economy wide climate change scheme was meant to be a priority of the recently (re)elected Labor government, though public opinion on any national scheme is currently very low. Legislation is expected to be introduced into Parliament in July. Some local experts expect the legislation will closely reflect the twice defeated cap and trade legislation titled “Carbon Pollution Reduction Scheme”, with some minor amendments to allow the scheme to start with a fixed price for a transitional period before moving to a full trading mechanism. The previously defeated Carbon Pollution Reduction Scheme did not initially allow for

---

defined within the IPCC Good Practice Guidelines, but the IPCC does refer to the USDA classification of soils. The USDA classification includes in its definition of soil “the ability to support rooted plants in a natural environment”, which clearly extends to soil supporting sea grasses. On this broad understanding of what constitutes “soil” all blue carbon ecosystems are included. See United States Department of Agriculture Natural Resources Conservation Service, *Soil Taxonomy, A Basic System of Soil Classification for Making and Interpreting Soil Surveys*, second edition (1999), Agriculture Handbook Number 436.

<sup>104</sup> See <http://www.climatechange.gov.au/en/government/initiatives/carbon-farming-initiative/methodology-development.aspx>.

<sup>105</sup> *Carbon Credits (Carbon Farming Initiative) Bill 2011*, Section 106.

<sup>106</sup> Based on three interviews with an NGO, a project developer, and a member of the Domestic Offsets Integrity Committee.



international offsets from the forest sector, but last minute compromises and amendments would have opened the scheme up to unlimited international offsets. It is unclear how any new legislation would address international offsets.

Given the dynamic nature of current Australian politics the scope and future of any such scheme is highly uncertain and should not be a high priority.

### 6.3. European Union

#### Findings and Recommendations

There is currently no direct entry point for blue carbon related activities under the EU ETS. One possible avenue for creating such an entry point would be to engage with European Commission and lobby for acceptance of 'blue carbon' credits under the EU ETS after 2020. The Commission has already confirmed it will consider the inclusion of LULUCF credits after 2020. If LULUCF credits are included, it will open the door for blue carbon if it is recognized under the CDM and JI, to the extent these: (i) may be allowed under Kyoto as per our assessment above, and (ii) the CDM and JI mechanisms (or similar) are operational. There is, however, too much uncertainty regarding this possibility and the long time frame makes this alternative a low priority for blue carbon stakeholders.

Article 24a of the EU ETS may open-up (at least in theory) a legal/regulatory entry for domestic LULUCF and blue carbon activities. However, the Commission's resistance to LULUCF credits in general and the need for implementing legislation in Member States to operationalize this provision makes this option a low priority.

It is worth noting that EU Member States are mandated under the EU ETS to use the revenues they will receive from the mandatory auctioning of allowances for the period 2013–2020 for *inter alia* "measures to avoid deforestation and increase afforestation and reforestation in developing countries that have ratified the international agreement on climate change". This means a potentially significant amount of additional EU funds may become available for REDD+, CDM afforestation and reforestation projects. EU Member States planning on dedicating part of their auctioning revenues to such afforestation and reforestation projects could be made aware of the possibility to invest these funds in projects related to mangroves.

#### Assessment

There are two normative instruments with potential relevance to blue carbon: the EU ETS and the Effort Sharing Decision (ESD).

#### *EU Emissions Trading Scheme (ETS)*

The EU ETS, which became operational in 2005,<sup>107</sup> is the world's largest multinational emissions trading scheme.<sup>108</sup> It includes the 27 EU Member States as well as Iceland, Liechtenstein and Norway. The ETS limits the CO<sub>2</sub> emissions of large installations which are estimated to represent about 40% of the EU's GHG emissions. The ETS is a "cap and trade" system. It conditionally allows for the use of credits from the Kyoto Protocol's CDM and JI mechanisms to comply with emissions reduction obligations, with the exception of nuclear and forest credits.<sup>109</sup>

So far three trading periods have been designed in the EU ETS: 2005–2007, 2008–2012 and 2013–2020. With each new trading period, the EU rules on emissions trading become stricter and the cap expands to cover a wider range of sectors. In the last revision of the ETS, the possibility of allowing CDM and JI credits

---

<sup>107</sup> Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC.

<sup>108</sup> Ellerman, A., Denny; Buchner, Barbara K. (January 2007). "The European Union Emissions Trading Scheme: Origins, Allocation, and Early Results". *Review of Environmental Economics and Policy* 1 (1): 66–87.

<sup>109</sup> Directive 2004/101/EC of the European Parliament and of the Council of 27 October 2004 amending Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community, in respect of the Kyoto Protocol's project mechanisms.



from certain types of LULUCF projects was investigated and rejected, mainly due to environmental integrity concerns. These included concerns regarding (i) non-permanence and reversibility of emissions reductions from such projects as well as leakage; (ii) the availability of sufficiently secure monitoring and reporting possibilities, (iii) simplicity, transparency and predictability of the EU ETS; and (iv) market flooding with LULUCF credits. In 2008 the EU decided it would consider recognition of LULUCF credits for ETS compliance only after 2020.

The Commission also explained that for the period until 2020 other sources of funding were considered more appropriate, referring explicitly to using proceeds from the auctioning of allowances within the EU ETS in the third trading period for forestry related purposes.<sup>110</sup> The EU ETS directive now provides specific obligations for Member State on the auctioning of allowances for the period 2013-2020. As to the revenues, the Directive provides that at least 50 % of the revenues generated from the auctioning of allowances should be used for *inter alia* “measures to avoid deforestation and increase afforestation and reforestation in developing countries that have ratified the international agreement on climate change” and “forestry sequestration in the Community.”<sup>111</sup>

Article 24 of the EU ETS provides a possibility, starting in the second trading period, for a Member State to apply emission allowance trading in accordance with the EU ETS to activities and gases which fall outside the scope of the Directive. However, when doing so the Member State must “take into account all relevant criteria, in particular the effects on the internal market, potential distortions of competition, the environmental integrity of the Community scheme and the reliability of the planned monitoring and reporting system.” Approval of the European Commission is also required.<sup>112</sup> As to effects on the market, environmental integrity and monitoring and reporting were the main concerns for not allowing LULUCF credits under the EU ETS. Accordingly, it is unlikely that Member States could successfully expand this EU ETS to include LULUCF activities in their emissions trading via article 24.

Article 24a was included in the last revision of the EU ETS. For the third trading Period (2013 - 2020), this article opens up the possibility of creating a domestic offset mechanism by which a project, approved by the Member State in which it is located, generates emission reductions which subsequently translate into carbon credits. Such measures for issuing allowances or credits would have to be additional to inclusions provided for in Article 24 and would only be adopted where inclusion through Article 24 would not be possible. Possible credits generated under a 24a mechanism could potentially be used for compliance purposes under the EU ETS.

The mechanism under Article 24a of the EU ETS could theoretically offer a European crediting instrument independent from the Kyoto framework and implementable at the domestic level. Unlike Article 24, Article 24a does not explicitly provide for the limitations relating to effects on the internal market, competition distortions, environmental integrity or reliability of monitoring and reporting and would therefore not right away exclude LULUCF activities. However, for Article 24a to become effective, delegated legislation (“implementing measures”) is required because many of the mechanism’s details, such as project areas, criteria for eligibility, project definition, participation, crediting principles, and credit title, are not yet defined. These implementing measures must ensure that double-counting of emission reductions is prevented and the implementation of other policy measures to reduce emissions is not impeded.<sup>113</sup> Whether the Commission indeed creates this implementing legislation and whether this legislation would allow for the possibility of crediting of LULUCF activities, is difficult to say. In light of the overall reluctance to allow LULUCF credits into the EU ETS, it does not seem likely that such a possibility would be opened through an offsetting mechanism based on Article 24a.

---

<sup>110</sup> Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Addressing the challenges of deforestation and forest degradation to tackle climate change and biodiversity loss, COM(2008) 645, p. 11.

<sup>111</sup> Directive 2003/87/EC, Article 10, para 3.

<sup>112</sup> Article 24, para 1.

<sup>113</sup> Article 24a para 1.

### *Effort Sharing Decision (ESD)*

The Effort Sharing Decision (ESD)<sup>114</sup> establishes GHG targets for Member States for the period 2013–2020. The decision covers all sectors except installations covered by the ETS, LULUCF<sup>115</sup> and international maritime shipping, together amounting to some 60% of total GHG emissions in the EU. Each EU Member State has set a cap on its respective emissions in these sectors. The individual targets vary, but are approximately -10% throughout the EU, which together with the reduction achieved by the EU ETS (-21% over 2005 levels) equals an overall reduction of -20% over 1990 levels.

In order to fulfil their emissions reduction obligations under the ESD member states may use CDM and JI credits under certain conditions that vary depending on if there is an international agreement or not. Importantly, one option for meeting the reduction obligations includes using CDM tCERs or ICERs from CDM afforestation and reforestation projects in least developed countries (LDCs) and small island developing states (SIDS).<sup>116</sup> Half of the 15 most mangrove-rich countries are included among the LDCs<sup>117</sup> and SIDS<sup>118</sup> (although none are top-five), which makes this potentially interesting for those countries. Member States that fulfil the conditions and may purchase tCERs and ICERs are Austria, Finland, Denmark, Italy, Spain, Belgium, Luxembourg, Portugal, Ireland, Slovenia, Cyprus and Sweden.

### *Including LULUCF under the ETS or the ESD*

As explained above, LULUCF is not included in the EU ETS and only indirectly in the ESD. If an international agreement on climate change is concluded, the ETS and ESD rules provide that the Commission must within 3 months of the signature of such an international agreement assess ways to include LULUCF in those rules.<sup>119</sup> This would include harmonized modalities ensuring permanence and the environmental integrity of the contribution of LULUCF as well as accurate monitoring and accounting.

In the event that no international agreement on climate change is approved by the Community by the end of 2010, which is in fact the case, the Commission would carry out these tasks by mid 2011, making a legal proposal aimed to enter into force from 2013 onwards.

In 2010, a LULUCF Expert Group was created to assist the Commission. In a summary report, the Expert Group concluded that it generally supported the inclusion of LULUCF activities into European mitigation efforts, but that these activities should not be linked to the EU ETS. The Expert Group suggested the options of establishing a separate policy framework for LULUCF or incorporating the sector in the ESD. The Group also concluded that, if LULUCF were to be included in the EU commitment, a full, mandatory inclusion in the 2020 target of all LULUCF emissions and removals might not be necessary or feasible. Those in the group who favored the inclusion of the LULUCF sector generally supported mandatory accounting for afforestation, reforestation, deforestation and, possibly, forest management.<sup>120</sup> A Communication from the European Commission is expected on this subject in June 2011.

## 6.4. California

### **Findings and Recommendations**

Mangrove forests in developing countries may be recognized under RED (reducing emissions from deforestation) (if the broader requirements for sectoral crediting for RED are met). California may also in

---

<sup>114</sup> Decision No 406/2009/EC of the European Parliament and of the Council of 23 April 2009 on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020.

<sup>115</sup> See Effort sharing decision, Article 2 (1) in conjunction with Annex I.

<sup>116</sup> Decision No 406/2009/EC, Article 5, para 1.

<sup>117</sup> Myanmar, Bangladesh, Guinea Bissau, Mozambique, and Madagascar.

<sup>118</sup> Papua New Guinea and Cuba.

<sup>119</sup> Decision No 406/2009/EC, Articles 8 and 9 and Directive 2003/87/EC, Article 28.

<sup>120</sup> Summary Report on the work carried out by European Climate Change Programme (ECCP) Expert Group on Climate Policy Land Use, land use Change and Forestry (LULUCF), 16 September 2010 at [http://ec.europa.eu/clima/events/0029/summary\\_ccplulucf\\_en.pdf](http://ec.europa.eu/clima/events/0029/summary_ccplulucf_en.pdf).

theory recognize mangrove forests under the Offset Projects from U.S. Forest Projects category. However, would be difficult in practice and soil carbon is often excluded.

Lobbying California to allow blue carbon in more broadly will likely be time consuming and difficult while there is still uncertainty over MRV. The demand for credits is not significant, though recognition of blue carbon as an eligible category would help build knowledge and demonstrate proof of concept. Additional work in California should not be seen as a high priority in the short term, though opportunities to expand sectoral crediting beyond RED to other areas should be monitored.

### Background

In 2006, California's Global Warming Solutions Act (AB 32) directed the California Air Resources Board (ARB) to develop plans to reduce the State's greenhouse gas emissions to 1990 levels by 2020 – representing an approximate 30% reduction from projected BAU emissions.<sup>121</sup> The Scoping Plan developed by ARB and approved in 2008, outlines how reductions are to be achieved via a combination of regulation, market mechanisms (i.e. cap-and-trade) and other actions, ultimately meeting the 2020 target and achieving an 80% reduction from 1990 levels by 2050. In mid-December 2010, the Board approved a draft resolution on formal cap-and-trade regulations, which were outlined in the Proposed Regulation Order and Staff Report: Initial Statement of Reasons (ISOR).

However, as of March 2011, further progress on implementation has been halted. A San Francisco Superior Court judge suspended implementation on the grounds that ARB violated the California Environmental Quality Act by failing to sufficiently analyze alternatives to a cap-and-trade system.<sup>122</sup> ARB is expected to both appeal the order and submit additional analysis, although the expected implementation date of January 1, 2012 is now unlikely.

### Assessment

The current Proposed Regulation Order does not mention blue carbon sources. While reducing emissions from deforestation (RED) is included as the sole activity under the sector-based approach, the details of what the ultimate accounting framework will look like are still being worked out and are not yet well developed. It is also not yet decided whether CARB (California Air Resources Board) itself will approve the sector-based credits, or whether this would be relegated to an approved external program. That said, early indications are that sector based credits will be limited to RED in the immediate future with little chance for expansion into other areas of the land use sector. Based on California's current limits, the maximum RED offset demand is limited to a total of 74.3 – 80.7 million tons of CO<sub>2</sub> between 2012 and 2020, with annual maximum volumes ranging from 3.5 – 15.6 million tons.<sup>123,124</sup> Currently, California has only signed agreements with Chiapas, Mexico and Acre, Brazil to establish offset programs, thus the initial demand is expected to fall well below the maximum (though actual demand is expected to be less than the theoretic maximum, as the caps on supply are installation based rather than across the program). For instance, the Governor of Chiapas estimates that the state could sell as much as two million credits in the California market over eight years.<sup>125</sup>

Aside from sector based offsets, another possible avenue for the inclusion of mangroves is under Offset Projects from U.S. Forest Projects. Generally, Offset Projects are limited to the U.S., Canada, and Mexico, although Forest Projects are currently limited to the U.S., and in the case of Improved Forest Management

---

<sup>121</sup> Personal communication.

<sup>122</sup> The Association of Irrigated Residents, et al. Vs. California Air Resources Board.

<sup>123</sup> Schneck et al. 2011. *Demand for REDD Carbon Credits: A Primer on Buyers, Markets, and Factors Impacting Prices*. Nicholas Institute for Environmental Policy Solutions Working Paper NI WP 11-01.

<sup>124</sup> Shillinglaw et al, 2010 *The California Carbon Market; Implications for Forest Carbon Offset Investment*, New Forests Market Outlook: December 2010. Available at: <http://www.newforests.com.au/news/pdf/articles/CaliforniaCarbonMarket2010.pdf>.

<sup>125</sup> Roosevelt, M. 2010. "Chiapas to California: preserving forests for dollars?" *Los Angeles Times*. Environment, 9 December 2010. Available at: <http://latimesblogs.latimes.com/greenspace/2010/12/cancun-climate-forests-carbon-trading-california-chiapas.html>.

(see below), the contiguous U.S. In 2005, the U.S. had approximately 195,000 ha of mangroves. This is down from approximately 275,000 ha in 1980, representing about a 30% reduction over 25 years. Between 1990 and 2000, almost 2% were being lost each year, however this slowed to only 0.5% between 2000 and 2005 (about 1000 ha/yr).<sup>126</sup>

While mangroves could in theory be included under each Project type<sup>127</sup> this would be difficult in practice. The methodology for calculating tree biomass is ill-suited for mangroves systems, and soil carbon is often excluded from all three project types. The Protocol states:

“To maintain consistency in project accounting and reporting, and because the methodologies for many of the optional pools are less standardized and carry with them more uncertainty, optional pools have been excluded from project accounting”.

In March 2011, CARB also issued a similar statement to the same effect. At least some of the basis for the decision was problems encountered by CARB in a wetland system. For the foreseeable future then, even if the Protocols could be used for mangrove systems, no credits could be accrued for soil carbon.

Additionally, the Protocol only applies to projects in the U.S., though CARB is currently developing a Mexico Forest Protocol. While this protocol is still in a relatively early stage of development, it is clear that it will focus on avoided conversion – albeit on the large areas of rainforest and dry forests – not mangroves. Moreover, to be eligible for Compliance Offset Credits, the protocol would have to be adopted by California.

Some efforts have already been made to have wetlands included in an offset protocol. However, California reportedly pushed back, stating that the science needed to be more fully developed. While there has been some interest in developing such national protocol that may meet California’s protocol requirements, wetlands vary regionally to such an extent that developing a single protocol for the entire US may be extremely difficult.

## 7. Options for blue carbon under voluntary standards

The voluntary carbon market sits outside the international trading mechanisms created by the Kyoto Protocol and domestic trading schemes such as the EU ETS. In 2009, approximately 94 MtCO<sub>2</sub>e were transacted in the global voluntary carbon market, valued at US\$387.4 million.<sup>128</sup> Land-based credits<sup>129</sup> accounted for less than a quarter of the total credits sold in over-the-counter transactions<sup>130</sup> (10.4 MtCO<sub>2</sub>e). Both volume and value of the voluntary market is very small compared to the size of the regulated markets. For comparison, in 2009, the regulated markets transacted 8,625 MtCO<sub>2</sub>e, valued at \$143.9 billion (up 7% from the previous year).<sup>131</sup> In other words, the voluntary market represents less than 3% of the value of the regulated markets.

---

<sup>126</sup> FAO. 2007. *The World’s Mangroves 1980–2005*. FAO Forestry Paper 153 (FAO 2007).

<sup>127</sup> See relevant definitions in the Compliance Offset Protocol for Forest Projects (Forest Offset Protocol) which are wide enough to include mangrove forests. ARB. 2010. Compliance Offset Protocol for Forest Projects. <http://www.arb.ca.gov/regact/2010/capandtrade10/cappt5.pdf>.

<sup>128</sup> Hamilton et al. 2010, *supranote* 33.

<sup>129</sup> Afforestation/Reforestation, Avoided Deforestation (REDD), Forest Management, Agricultural Soil, Agro-Forestry, and Other Land-Based projects.

<sup>130</sup> Transactions related to offset project credits that were negotiated bilaterally, outside of any exchange. They represent approximately half of the voluntary market volume.

<sup>131</sup> Hamilton et al. 2010 *supranote* 33.



On a per-credit-basis, prices in the voluntary market are much lower than in the regulated markets. In 2009, the average credit price for an Afforestation/Reforestation project was only US\$4.6 per tCO<sub>2</sub>e. Currently, CDM CERs are trading at EUR 13.11, or US\$18.82.<sup>132</sup> REDD projects averaged only US\$2.9 per tCO<sub>2</sub>e, while the highest average credit price for land-based projects, Forest Management, only averaged US\$7.3 per tCO<sub>2</sub>e.

Despite the small size of the voluntary market compared to compliance markets, it tends to be more open to new types of projects that currently fall outside the regulated market. Also, while small, it may be significant in size relative to blue carbon's potential, and therefore, warrants consideration.

## 7.1. Key Findings

- The voluntary market is small (less than 3% of the value of the regulated markets), but is more open to blue carbon.
- Methodologies developed for blue carbon restoration and conservation projects in the voluntary market may ultimately inform the development of regulated market methodologies.
- VCS is taking an important first step in developing methodologies specifically targeting blue carbon conservation.

## 7.2. Verified Carbon Standard (VCS)

### Findings and Recommendations

The VCS is the leading voluntary market standard and is currently considering expanding its rules to include blue carbon. Additional technical support is needed to peer review the new rules as they are being developed, but aside from this, additional support for these efforts is likely not needed at present.

### Background

In 2009, the Verified Carbon Standard (VCS) held the largest share of the voluntary market; some 35% by transaction volume.<sup>133</sup> Currently, the VCS provides requirements and rules for five eligible AFOLU project categories: Afforestation, Reforestation and Revegetation (ARR), Agricultural Land Management (ALM), Improved Forest Management (IFM), Reduced Emissions from Deforestation and Degradation (REDD), and Peatland Rewetting and Conservation (PRC).

### Assessment

Beginning in March 2011, the VCS began a new initiative to develop requirements for crediting wetlands conservation projects. The work will be led by Restore America's Estuaries, who will oversee a working group of technical experts from the Voluntary Carbon Standard Association, Silvestrum, ESA PWA, the Smithsonian Environmental Research Center, and the U.S. Forest Service. The initiative "will expand the scope for crediting wetlands projects to include mangroves and coastal and tidal wetlands. A draft of these new requirements should be completed by the second half of 2011 with the aim to submit final Wetlands Requirements to the VCS Steering Committee and Board for approval by December 2011."<sup>134</sup> Until a draft of these requirements is posted for public comment however, it is difficult to comment on the scope or the scale of activities VCS may allow.

---

<sup>132</sup> As of May 6, 2010, using a conversion rate of US\$1 = 0.6965 EUR.

<sup>133</sup> Hamilton et al. 2010, *supranote* 33.

<sup>134</sup> [www.v-c-s.org/advisory.html](http://www.v-c-s.org/advisory.html).





## 8. Other Relevant Areas

### 8.1. Key Findings

- Fast start finance presents an opportunity to leverage and deploy additional funds, increasing experience and awareness in relation to the mitigation and adaptation potential of blue carbon activities.
- Many bilateral and multilateral funds and initiatives are already deploying fast-start finance for blue carbon-related mitigation and adaptation activities in mangrove areas and coastal zones.
- Other types of international support may also be available for blue carbon sinks and reservoirs. This includes climate finance not declared or framed as fast-start finance and non-climate related finance, such as biodiversity funding provided by the US, Germany and France.

### 8.2. Fast-start Finance and Other International Support

#### Findings and Recommendations

Fast start finance may present an opportunity for all blue carbon sinks and reservoirs. While there may be a greater focus on mangroves potentially included under REDD+, fast-start finance for activities in marine and coastal ecosystems in general may be attractive to finance as they can yield both mitigation and adaptation benefits. It may also not be limited by IPCC definitions or gaps in accounting, making it an interesting source of funding to support demonstration activities that could be used to generate data to fill these gaps.

A summary of the amount of fast start funding pledged per country along with channels through which some of this funding is being disbursed is set out in Annex II. Providing additional advice on which of the sources of fast start finance should be approached as a first priority requires a detailed comparative analysis of the project cycle and efficiency of each institution to disburse funds, scope of activities financed, and potential willingness or interest in supporting blue carbon initiatives. This comparative analysis and ranking is unfortunately beyond the scope of this report. That said, the summary information provided in Annex II identifies a number of well-known agencies that readers of this report will be familiar with and may have their own opinions on their accessibility.

Non-climate related funding, in particular funding available for biodiversity activities provided *inter alia* by the United States Agency for International Development (USAID), the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), and Agence Française de Développement (AfD), could also constitute a potential relevant source of finance for blue-carbon activities.

#### Background

At the COP in Cancun developed countries confirmed their collective commitment to provide US\$30 billion in “new and additional” fast-start finance to developing countries in the period 2010-2012. In Cancún, it was also confirmed that fast-start finance for adaptation will be “prioritized for the most vulnerable developing countries, such as the least developed countries, small island developing states and Africa”.<sup>135</sup>

Many activities associated with early-finance for mitigation activities have already started since 2005. In particular in the context of REDD+, triggered by a specific call from COP 13 in Bali, several countries and international organizations established initiatives and programs dedicated to support efforts to reduce emissions from deforestation and forest degradation, including capacity-building, data collection, estimates of emissions, demonstration projects, and institutional reforms (so-called ‘readiness support’).<sup>136</sup>

<sup>135</sup> See UNFCCC Decision 1/CP.13, paragraph 95.

<sup>136</sup> See UNFCCC Decision 2/CP.13, paragraph 2.

A study from the World Resources Institute (WRI) shows that fast-start finance pledges are nearing the US\$30 billion target. As of 24 November 2010, about US\$28 billion was pledged by developed countries, with around US\$12 billion committed for 2010, US\$213 million for 2011, and another US\$213million for 2012.<sup>137</sup> The voluntary nature of the reporting on fast-start finance, however, has led to a considerable lack of consistency and transparency in the quality and quantity of information reported by developed countries so far.<sup>138</sup>

Fast-start finance for developing countries is currently being deployed through a multitude of bilateral and multilateral development agencies. These include funds and initiatives managed and channeled by a number of multilateral development banks including the World Bank, the Inter-American Development Bank (IADB), the Asian Development Bank (ADB), the European Bank for Reconstruction and Development (EBRD, amongst others; and bilateral development agencies, such as the Japan International Cooperation Agency (JICA), UK Department for International Development (DFID), and the Norwegian Agency for Development Cooperation (NORAD), to name a few. Examples of fast-start finance being deployed to halt emissions and increase resilience in wetlands and coastal areas include:

- EUR27 million for wetland conservation projects, including mangrove forest conservation, adaptation to climate change in coastal regions of the Pacific, and peat forest conservation in Indonesia, facilitated by the German International Climate Initiative (ICI).<sup>139</sup> ICI funding of approximately EUR120 million per year comes from the revenues of the sale of European emission allowances under the EU ETS; and
- EUR25 million allocated in 2010 to Ethiopia, Nepal and the Pacific region within the Global Climate Change Alliance (GCCA) established and funded by EU. Projects financed included, for instance, rehabilitation of degraded micro-watersheds and sustainable use of rehabilitated watersheds along the Nile basin.

Other relevant climate-related finance (not necessarily linked to or announced as fast-start finance) is being channeled domestically via NGOs and national trust funds. For instance, Mangroves for the Future (MFF), a multi-partner initiative established to counter tsunami effects in Indian Ocean coastal communities, and supported, amongst others, by UNEP, UNDP, Wetlands Internationals, and NORAD, is currently promoting projects and small-grant facilities to enhance coastal ecosystem management in the region.<sup>140</sup> Examples of national trust funds include:

- the Mesoamerican Reef (MAR) Fund, a joint programme of four national environmental trust funds that raise, manage, and channel international funding to activities related to the sustainable use of marine and coastal resources in the region. The MAR Fund has received contributions from the German Federal Ministry for Economic Cooperation, the Swiss Foundation for Development, World Wildlife Fund (WWF), The Nature Conservancy (TNC).<sup>141</sup>

<sup>137</sup> See WRI, Summary of developed country fast-start climate finance pledges, at [http://pdf.wri.org/climate\\_finance\\_pledges\\_2010-11-24.pdf](http://pdf.wri.org/climate_finance_pledges_2010-11-24.pdf).

<sup>138</sup> The Cancun Agreements did not provide for any specific definition of 'fast-start finance' and therefore countries have so far adopted their own definition of term. A discussion as to what types of fund channeled to developing countries should or not be deemed 'fast-start finance' is beyond the scope of this report. For the purposes of this study, we refer to fast-start funds and channels as announced by countries or referred to in relevant literature made publicly available.

<sup>139</sup> See <http://www.bmu-klimaschutzinitiative.de/en/press?p=1&d=205>.

<sup>140</sup> This includes a wetland conservation project in the Maha Oya (Sri Lank), alternative sustainable use for mangroves in the Sundarban Tiger Reserve (in West Bengal), and a mangrove conservation and regeneration project at Mithapur (India). See <http://www.mangrovesforthefuture.org/index.html>.

<sup>141</sup> The MAR Fund is comprised by Belize's PAs Conservation Trust (PACT), Fundación para la Conservación de los Recursos Naturales y Ambiente en Guatemala, Honduras' Fundación Biosfera, and Fondo Mexicano para la Conservación de la Naturaleza (FMCN). See [http://www.marfund.org/en/index\\_ingles\\_internal.html](http://www.marfund.org/en/index_ingles_internal.html); and

- the Indonesia Climate Change Trust Fund (ICCT), which provides support for research and technology development on sustainable peat land management to enhance carbon sequestration in these ecosystems.<sup>142</sup> The ICCT is financed mostly with resources from Department for International Development (DFID) and the Australian Government's Overseas Aid Program (AusAID), and channeled through the UNDP.

Outside the climate arena, funds committed to biodiversity may also comprise an important source of finance for blue carbon activities, in particular for mangroves. The German Government, for instance, has made available EUR260 million in 2009 and plans to make an additional EUR500 million available per year after 2013 to support biodiversity, including wetland conservation and integrated coastal zone management.<sup>143</sup> USAID dedicated in 2009 around US\$200 million for biodiversity activities, including improved wetland management to increase inland fisheries in Bangladesh and mangrove restoration and rehabilitation in the Philippines.<sup>144</sup>

Fast-start finance and other international support are normally made available through a mix of concessional and non-concessional loans or a mix of both grant and loan assistance. The channels and purpose of the initiatives, funds, and institutions above mentioned vary greatly, with some focused on providing support for financing projects, others on technical assistance, and others on guarantees, and philanthropy.

#### Assessment

Fast-start finance and other available international support can be accessed via direct applications to the relevant institutions and initiatives channeling funds to developing countries. Depending on the specific rules of each institution/initiative, blue carbon stakeholders could apply for funding as an independent project developer or in partnership with host country authorities and/or domestic agencies. The degree of effort necessary to access funding will differ according to the criteria and priorities adopted by each institution/initiative to approve projects and release funds.

Annex II to this report provides information on fast-start finance already pledged by developed countries, the amount of finance available until 2012, and the initiatives and institutions used by donor countries to deploy these resources. The Annex is based upon fast-start finance data publicly disclosed by countries. It should be noted that there is considerable disparity (in terms of content and format) in the information provided. This renders comparative analysis particularly challenging.

#### Text Box 2 Japan's bilateral assistance

Japan is currently the largest bilateral donor to the global forestry sector, providing US\$2.27 billion in assistance between 2000 and 2009.<sup>145</sup> At COP 15 in December 2009, Japan pledged US\$15 billion for fast-start financing,

---

Conservation Finance Alliance and PWC, "Report for the Conservation Finance Alliance – National REDD+ funding frameworks and achieving REDD+ readiness – findings from consultation", October 2010, available at: [http://www.thereddesk.org/resources/reports/cfa\\_national\\_redd\\_funding\\_frameworks\\_and\\_achieving\\_redd\\_readiness\\_findings\\_from\\_co](http://www.thereddesk.org/resources/reports/cfa_national_redd_funding_frameworks_and_achieving_redd_readiness_findings_from_co).

<sup>142</sup> See <http://www.icctf.org/site/node/19>.

<sup>143</sup> Funding for biodiversity is routed mostly via the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. See information available at <http://www2.gtz.de/dokumente/bib-2010/gtz2010-0421en-biodiversity-german-dc.pdf>.

<sup>144</sup> See USAID, Biodiversity Conservation and Forestry Programs – Annual Report, October 2010, available at [http://www.usaid.gov/our\\_work/environment/biodiversity/pdf/biodiversity\\_report\\_2010.pdf](http://www.usaid.gov/our_work/environment/biodiversity/pdf/biodiversity_report_2010.pdf).

<sup>145</sup> Government of Japan. 2011. Study on REDD-plus Related Activities. Presentation at REDD-plus Partnership. Bangkok, Thailand, 10-11 April 2011 (Government of Japan 2011).

approximately US\$500 million of which is earmarked for the sector. As of September 2010, US\$224 million has already implemented – \$172 million as grants and \$47 million as loans.<sup>146</sup> Just under three-quarters (US\$162 million) has gone to the Forest Preservation Program, being implemented across 21 countries, and another \$3.9 million has gone to the International Tropical Timber Organization.<sup>147</sup>

In 2010, the Japanese Ministry of Economy, Trade and Industry (METI) and the Ministry of the Environment (MOE) had a budget of US\$9 million to fund feasibility studies. These were conducted by private companies in cooperation with organizations in developing countries and meant to explore and design joint GHG reduction projects and bilateral offset mechanisms.<sup>148</sup> One such project receiving funding is a NAMA feasibility study on peat management in Indonesia. In addition, five feasibility studies specifically related to REDD+ were carried out in 2010, including two others in top 15 most mangrove-rich countries (Indonesia and Brazil). The MOE also sponsors scientific studies related to REDD+ activities conducted by Japanese institutes. In 2010, these studies included three top-15 most mangrove-rich countries (Indonesia, Malaysia, and Papua New Guinea).

In all, Japan has funded feasibility studies (across all sectors) in six of the top 15 most mangrove-rich countries (Indonesia, Brazil, Mexico, Papua New Guinea, India, and the Philippines). While no blue carbon projects or studies have specifically been funded, Japan has demonstrated clear interest in both REDD+ and in providing funding for NAMA development. Given these interests, Japan may be a source of bilateral funding for blue carbon activities.<sup>149</sup>

### 8.3. Adaptation

#### Findings and Recommendations

Current levels of adaptation funding (US\$1.6 billion) are much lower than mitigation funding. However, given the importance of blue carbon ecosystems for adaptation, adaptation finance should not be completely ignored as activities with both adaptation and mitigation co-benefits may receive higher priority for funding. Adaptation finance may increase in significance once the GCF is established.

#### Background

Adaptation to climate change is one of the four pillars of the Bali Action Plan.<sup>150</sup> The UNFCCC estimates that between US\$28–67 billion will be needed annually by 2030,<sup>151</sup> while the 2007–2008 UN Development Report places the figure at US\$86 billion by 2015.<sup>152</sup> The majority of international funds specifically targeting adaptation are principally organized through four multilateral funds (Table 5).<sup>153</sup> The total amount of pledges to these four funds, some US\$1.6 billion as of February 2011, falls well short of the anticipated level of funding needed. It is also well below the level of funding available for mitigation activities.

<sup>146</sup> Japanese Ministry of Foreign Affairs. 2010. Japan's Fast-Start Financing for Developing Countries up to 2012. Available from: [http://www.mofa.go.jp/policy/environment/warm/cop/pdfs/financing\\_en.pdf](http://www.mofa.go.jp/policy/environment/warm/cop/pdfs/financing_en.pdf).

<sup>147</sup> Government of Japan 2011, *supranote* 148.

<sup>148</sup> Government of Japan 2011, *supranote* 148.

<sup>149</sup> It should be noted however, that speculation exists regarding the May 2011 disaster in Japan, and the possibility that it may prevent Japan from meeting all of its ODA pledges. Some members from the ruling Democratic Party are proposing that aid disbursement be temporarily halted for a year in order to raise recovery funds. One proposal called for cuts of approximately US\$1.2 billion, although it is unclear which areas of ODA would be affected (Mainichi Japan. 2011. "Matsumoto warns of negative impact from possible ODA cuts." *The Mainichi Daily News*. National News. 8 April 2011. Available from:

<http://mdn.mainichi.jp/mdnnews/national/archive/news/2011/04/08/20110408p2g00m0dm033000c.html>).

<sup>150</sup> Decision 1/CP.13.

<sup>151</sup> UNFCCC, Preliminary estimates of additional investments and financial flows needed for adaptation in 2030, available at:

[http://unfccc.int/files/cooperation\\_and\\_support/financial\\_mechanism/application/pdf/adaptation\\_presentation\\_joe\\_l\\_smith.pdf](http://unfccc.int/files/cooperation_and_support/financial_mechanism/application/pdf/adaptation_presentation_joe_l_smith.pdf).

<sup>152</sup> UNDP, Human Development Report 2007/08, Chapter 4: Adapting to the inevitable: National action and international cooperation, p. 194, available at: [http://hdr.undp.org/en/media/HDR\\_20072008\\_EN\\_Chapter4.pdf](http://hdr.undp.org/en/media/HDR_20072008_EN_Chapter4.pdf).

<sup>153</sup> O'Sullivan R. et al, *Creation and Evolution of Adaptation Funds* (2011), WWF publication, Washington D.C.



**Table 5 Four major multilateral funds specifically targeting adaptation to climate change.**

Fund	Total USD	Overseeing Body	Eligible Countries
<b>Adaptation Fund (AF)</b>	\$197.32 million	Kyoto Protocol	Developing country Parties to Kyoto Protocol (no countries with significant mangroves approved or endorsed yet)
<b>Least Developed Countries Fund (LDCF)</b>	\$262.29 million	UNFCCC	48 Least Developed Countries (LDCs) (Myanmar, Bangladesh, Guinea Bissau, Mozambique, Madagascar eligible)
<b>Special Climate Change Fund (SCCF)</b>	\$149.29 million	UNFCCC	All non-Annex I, with emphasis on most vulnerable in Africa, Asia, and SIDS.
<b>Pilot Program for Climate Resilience</b>	\$1.036 billion	The World Bank	Active MDB country program, with priority to LDCs and SIDS (Bangladesh, Mozambique, Papua New Guinea invited to date)

### Assessment

Despite the currently limited availability of adaptation funding, half of the 15 most mangrove-rich countries are included among the LDCs<sup>154</sup> and SIDS<sup>155</sup>, and may be more likely to receive priority for adaptation funding. Moreover, several projects impacting blue carbon have been proposed by countries in their National Adaptation Programmes of Action (NAPAs)<sup>156</sup> or are already in the process of approval. For instance, Bangladesh's NAPA calls for a community coastal afforestation project, with the dual goal of adaptation and mitigation (US\$23 million).<sup>157</sup> Mozambique's includes reduction of climate change impacts in coastal zones, in part through the identification of rehabilitation techniques for dunes and mangroves,<sup>158</sup> while Madagascar's calls for the rehabilitation of degraded areas, including the planting of mangroves (US\$32,500).<sup>159</sup> Guinea Bissau includes a specific Observatory for Mangrove Monitoring and Evaluation Project, which seeks to monitor mangrove cover, provide a framework for evaluating projects and actions imparting mangroves, and protect littoral habitats and ecological process (US\$800,000).<sup>160</sup>

Under the SCCF, Mexico has a GEF Chief Executive Officer (CEO) endorsed Adaptation to Climate Change Impacts on the Coastal Wetlands Project, which seeks to implement pilot measures in the Gulf of Mexico to understand the integrity and stability of coastal wetlands and their inland watersheds under climate change. The project is expected to cost about US\$24 million.

<sup>154</sup> Myanmar, Bangladesh, Guinea Bissau, Mozambique, and Madagascar.

<sup>155</sup> Papua New Guinea and Cuba.

<sup>156</sup> Plans submitted to the UNFCCC by least developed countries (LDCs) to help them prioritize their adaptation needs.

<sup>157</sup> Government of Bangladesh. 2005. National Adaptation Programme of Action.

<sup>158</sup> Government of Mozambique. 2007. National Adaptation Programme of Action.

<sup>159</sup> Government of Madagascar. 2006. Programme D'Action National D'Adaptation Au Changement Climatique.

<sup>160</sup> Government of Republic of Guinea-Bissau. 2006. National Programme of Action of Adaptation to Climate Change.



## Annex I: Status and development of NAMAs in relevant countries

The following table includes information pertinent to the status and development of NAMAs in the top fifteen most mangrove-rich countries,<sup>161</sup> with the addition of those countries that have already included blue carbon ecosystems in their NAMA submissions (Eritrea, Ghana, Sierra Leone). The last column ranks the relative priority of each country for targeting to develop blue carbon NAMAs. Note that the priorities are divided between readiness (data collection, capacity building, etc.) and implementation (demonstration or pilot activities for those countries with sufficient data/inventories and capacity), though implementation activities may also involve some research and learning on estimating emissions and removals and other aspects of MRV. The rankings take into account the relative area of mangrove cover (as a proxy for blue carbon ecosystems); whether the country already submitted some information related to NAMAs and the level of detail it contains; the degree of compliance with guidance from the Ramsar Convention and the state of data collection/inventory; the degree to which blue carbon has been addressed in national development strategy; and demonstrated political will toward blue carbon conservation, to the degree that it can be gleaned from national communications regarding the above areas (e.g. countries that have not completed Ramsar National Communications may have lower political will in the prioritization of blue carbon ecosystems).

---

<sup>161</sup> Giri et al. 2011, *supranote* 71.



Country	Mangrove Area (ha) <sup>162</sup>	UNFCCC and Kyoto Protocol			Ramsar Convention			Blue Carbon in Development Plan	Priority for Blue Carbon NAMAs
		Voluntary GHG Reduction Goals <sup>163</sup>	Blue Carbon in NAMA <sup>164</sup>	Blue Carbon in NAPA <sup>165</sup>	Member Ramsar	National Wetland Policy/ Plan	National Wetland Inventory		
Indonesia	3,112,989	26% by 2020	No • Reference is made to sustainable peat land management	N/A	Yes	Yes • National Strategy and Action Plan for Wetland Management (NSAPM Wetland 2004) • National Strategy on Management of Mangrove Ecosystems (NSMME) • Management of Coastal Zones and Small Islands (Act 27/2007) • Indonesian Biodiversity Strategy and Action Plan (IBSAP) <sup>166</sup>	Yes	Yes <sup>167</sup> • National Strategy for Sustainable Development incorporates wetlands and poverty reduction • Wetland Poverty Reduction Program (WPRP)	High (Implementation)
Brazil	962,683	36.1% - 38.9% by 2020	No	N/A	Yes	Partial (included in other policies) • National Committee on Wetlands • National Plan for Protected Areas • National Policy on Biodiversity • National Water Resources Policy • Lacks Integrated Coastal Management strategy <sup>168</sup>	Yes	Partially • National Policy for Sustainable Development	High (Implementation)

<sup>162</sup> Giri et al. 2011, *supranote* 71.

<sup>163</sup> N/A indicates the country did not submit a NAMA.

<sup>164</sup> N/A indicates the country did not submit a NAMA.

<sup>165</sup> N/A Indicates the country did not submit a NAPA.

<sup>166</sup> See Government of Indonesia. 2009. Fourth National Report to the Convention on Biological Diversity. <http://www.cbd.int/doc/world/id/id-nr-04-en.pdf>.

<sup>167</sup> Government of Indonesia. 2008. National Report on the Implementation of the Ramsar Convention on Wetlands.

<sup>168</sup> Government of Brazil. 2010. Fourth National Report to the Convention on Biological Diversity.



Country	Mangrove Area (ha) <sup>162</sup>	UNFCCC and Kyoto Protocol			Ramsar Convention			Blue Carbon in Development Plan	Priority for Blue Carbon NAMAs
		Voluntary GHG Reduction Goals <sup>163</sup>	Blue Carbon in NAMA <sup>164</sup>	Blue Carbon in NAPA <sup>165</sup>	Member Ramsar	National Wetland Policy/ Plan	National Wetland Inventory		
Mexico	741,917	Up to 30% of BAU scenario by 2020	No	N/A	Yes	Developing National Strategy for the Care of Coastal Wetlands; also: <ul style="list-style-type: none"> <li>National Environmental Policy for Sustainable Development of Oceans and Coasts</li> <li>Implementing Regional Management Plan for the Conservation and Sustainable Management of Mangroves in National Wetlands</li> </ul>	Yes	Partially <ul style="list-style-type: none"> <li>Implicit considered under environmental sustainability in National Development Plan<sup>169</sup></li> </ul>	High (Implementation)
Nigeria	653,669	N/A	N/A	N/A	Yes	In Process <sup>170</sup>	In Process	Partially <ul style="list-style-type: none"> <li>Implicit in National Biodiversity Strategy and Action Plan (NBSAP)</li> </ul>	High (Readiness)
Malaysia	505,386	N/A	N/A	N/A	Yes	Yes <ul style="list-style-type: none"> <li>National Policy on Wetlands (2004)</li> </ul>	In Process	Yes <ul style="list-style-type: none"> <li>National Physical Plan includes Coastal Zone Physical Plan<sup>171</sup></li> </ul>	High (Implementation)
Myanmar	494,584	N/A	N/A	N/A	Yes	No	Yes	Partially <sup>172</sup> <ul style="list-style-type: none"> <li>Myanmar Agenda 21 includes management of coastal and marine ecosystems</li> <li>Implicit in National Sustainable Development Strategy</li> </ul>	Medium (Readiness)

<sup>169</sup> Government of Mexico. 2008. National Report on the Implementation of the Ramsar Convention on Wetlands.

<sup>170</sup> Government of Nigeria. 2008. National Report on the Implementation of the Ramsar Convention on Wetlands.

<sup>171</sup> Government of Malaysia. 2010. Tenth Malaysia Plan 2011-2015. Chapter 6.

<sup>172</sup> Government of Myanmar. 2008. National Report on the Implementation of the Ramsar Convention on Wetlands.





Country	Mangrove Area (ha) <sup>162</sup>	UNFCCC and Kyoto Protocol			Ramsar Convention			Blue Carbon in Development Plan	Priority for Blue Carbon NAMAs
		Voluntary GHG Reduction Goals <sup>163</sup>	Blue Carbon in NAMA <sup>164</sup>	Blue Carbon in NAPA <sup>165</sup>	Member Ramsar	National Wetland Policy/ Plan	National Wetland Inventory		
<b>PNG</b>	480,121	N/A	No	N/A	Yes	No	Partial <sup>173</sup>	Partially <sup>174</sup> <ul style="list-style-type: none"> <li>Implicitly in Papua New Guinea Strategic Development Plan 2010-2030</li> </ul>	Medium <sup>175</sup> (Readiness)
<b>Bangladesh</b>	436,570	N/A	N/A	Yes	Yes	Partial <ul style="list-style-type: none"> <li>National Water Policy includes statement on protection and restoration of wetlands and mangroves</li> <li>Coastal Zone Policy (2005)</li> <li>National Adaptation Plan of Action</li> </ul>	No	Yes <sup>176</sup> <ul style="list-style-type: none"> <li>National Sustainable Development Strategy includes wetland protection</li> <li>National Strategy for Accelerated Poverty Reduction II includes wetland protection<sup>177</sup></li> <li>However, little on implementation</li> </ul>	High (Readiness)
<b>Cuba</b>	421,538	N/A	N/A	N/A	Yes	Partial / In Process <sup>178</sup> <ul style="list-style-type: none"> <li>Currently included under National Environmental Strategy</li> <li>National Program on Wetlands development a priority</li> </ul>	In Process	Partially	High (Readiness)

<sup>173</sup> Based on Evidence in Fourth National Report to the Convention on Biological Diversity (2010).

<sup>174</sup> Government of Papua New Guinea. 2010. Fourth National Report to the Convention on Biological Diversity.

<sup>175</sup> PNG has not submitted National Communication to the Ramsar Secretariat since 2002, making it difficult to determine.

<sup>176</sup> Government of Bangladesh. 2008. National Sustainable Development Strategy (NSDS).

<sup>177</sup> Government of Bangladesh. 2009. Steps Towards Change: National Strategy for Accelerated Poverty Reduction II, FY 2009-11. <http://www.lcgbangladesh.org/prsp/docs/PRS%20Bangladesh%202010%20final.pdf>.

<sup>178</sup> Government of Cuba. 2008. National Report on the Implementation of the Ramsar Convention on Wetlands.



Country	Mangrove Area (ha) <sup>162</sup>	UNFCCC and Kyoto Protocol			Ramsar Convention			Blue Carbon in Development Plan	Priority for Blue Carbon NAMAs
		Voluntary GHG Reduction Goals <sup>163</sup>	Blue Carbon in NAMA <sup>164</sup>	Blue Carbon in NAPA <sup>165</sup>	Member Ramsar	National Wetland Policy/ Plan	National Wetland Inventory		
India	368,276	N/A	No	N/A	Yes	Partial / In Process <ul style="list-style-type: none"> <li>Currently included under National Environment Policy</li> <li>Draft regulatory framework for wetland conservation.<sup>179</sup></li> </ul>	In Process	Partially <ul style="list-style-type: none"> <li>Conservation and Management of Mangroves, Coral Reefs, and Wetlands Scheme included, but with few details<sup>180</sup></li> </ul>	High (Readiness)
Guinea Bissau	338,652	N/A	N/A	Yes	Yes	Partial <ul style="list-style-type: none"> <li>National Conservation Strategy (SNC) includes Program of Action for the Conservation of Mangroves<sup>181</sup></li> </ul>	Unknown	Partially, but outdated <sup>182</sup>	Low (Readiness) <sup>183</sup>
Mozambique	318,851	N/A	N/A	Yes	Yes	No / In Development <ul style="list-style-type: none"> <li>Draft national strategy for the management of wetlands<sup>184</sup></li> </ul>	In Process	No	High (Readiness)
Madagascar	278,078	N/A	No <ul style="list-style-type: none"> <li>Restoration of the Torotorofotsy humid-zone (9000 ha) (inland wetlands).</li> </ul>	Yes	Yes	Partial <sup>185</sup> / In Development <ul style="list-style-type: none"> <li>National Environmental Action Plan</li> <li>National Strategy for Biodiversity Sustainable Management</li> <li>National Strategy for Wetlands in preparation<sup>186</sup></li> </ul>	In Process	Partially <sup>187</sup> / In development <sup>188</sup>	High (Readiness)

<sup>179</sup> Government of India. 2008. National Report on the Implementation of the Ramsar Convention on Wetlands.

<sup>180</sup> Government of India. 2008. Eleventh Five Year Plan (2007-2012). Inclusive Growth (Vol. 1).

<sup>181</sup> Government of Guinea Bissau. 2010. Fourth National Report to the Convention on Biological Diversity.

<sup>182</sup> Government of Guinea Bissau. 2010. Fourth National Report to the Convention on Biological Diversity.

<sup>183</sup> Guinea-Bissau has not submitted a National Communication to the Ramsar Secretariat since they were published on-line (1999).

<sup>184</sup> Government of Mozambique. 2008. National Report on the Implementation of the Ramsar Convention on Wetlands.

<sup>185</sup> Government of Madagascar. 2009. Fourth National Report to the Convention on Biological Diversity.

<sup>186</sup> Government of Madagascar. 2008. National Report on the Implementation of the Ramsar Convention on Wetlands.

<sup>187</sup> Government of Madagascar. Madagascar Action Plan 2007-2012.

<sup>188</sup> Government of Madagascar. 2008. National Report on the Implementation of the Ramsar Convention on Wetlands.



Country	Mangrove Area (ha) <sup>162</sup>	UNFCCC and Kyoto Protocol			Ramsar Convention			Blue Carbon in Development Plan	Priority for Blue Carbon NAMAs
		Voluntary GHG Reduction Goals <sup>163</sup>	Blue Carbon in NAMA <sup>164</sup>	Blue Carbon in NAPA <sup>165</sup>	Member Ramsar	National Wetland Policy/ Plan	National Wetland Inventory		
Philippines	263,137	N/A	N/A	N/A	Yes	Partial (included in several policies by wetland type, incl:) <ul style="list-style-type: none"> <li>Integrating Coastal Management as a National Strategy to ensure sustainable development of country's coastal and marine environment and resources<sup>189</sup></li> </ul>	No, to be developed	Yes <sup>190</sup>	High (readiness)

<sup>189</sup> Government of Philippines. 2008. National Report on the Implementation of the Ramsar Convention on Wetlands

<sup>190</sup> Government of Philippines. 2004. Medium Term Philippine Development Plan 2004-2010.



Country	Mangrove Area (ha) <sup>162</sup>	UNFCCC and Kyoto Protocol			Ramsar Convention			Blue Carbon in Development Plan	Priority for Blue Carbon NAMAs
		Voluntary GHG Reduction Goals <sup>163</sup>	Blue Carbon in NAMA <sup>164</sup>	Blue Carbon in NAPA <sup>165</sup>	Member Ramsar	National Wetland Policy/ Plan	National Wetland Inventory		
Eritrea	6,400 <sup>191</sup>	Not Indicated	Yes <ul style="list-style-type: none"> <li>Projects and programmes for the sustainable management of biomass resources, forests and the sea, as well as other terrestrial, coastal and marine ecosystems.</li> </ul>		No				Low
Ghana	12,400 <sup>192</sup>	Not Indicated	Yes <ul style="list-style-type: none"> <li>Reference is made to rehabilitation of degraded wetlands.</li> </ul>		Yes				Low

<sup>191</sup> FAO 2007, *supranote* 129.

<sup>192</sup> FAO 2007, *supranote* 129.



Country	Mangrove Area (ha) <sup>162</sup>	UNFCCC and Kyoto Protocol			Ramsar Convention			Blue Carbon in Development Plan	Priority for Blue Carbon NAMAs
		Voluntary GHG Reduction Goals <sup>163</sup>	Blue Carbon in NAMA <sup>164</sup>	Blue Carbon in NAPA <sup>165</sup>	Member Ramsar	National Wetland Policy/ Plan	National Wetland Inventory		
Sierra Leone	100,000 <sup>193</sup>	Not Indicated	Yes <ul style="list-style-type: none"> <li>Sustainable management and protection of forest reserves and catchment areas, including mangroves, and coastal and inland wetlands</li> </ul>		Yes			Low	

<sup>193</sup> FAO 2007 , *supranote* 129.



## Annex II: Fast-start finance and channelling institutions

The following table shows both the amounts of fast-start finance pledged by developed countries and the channelling programs and institutions to which these pledges were made and disbursed. It should be noted that the figures contained in the table may not be exact values, or they may be out dated due to constraints in obtaining consistent data. Reputable sources were used in its compilation, although discrepancies exist between these sources – sometimes in the order of tens of millions of USD. These discrepancies may be due to the sources using a combination of different monetary conversion rates, using out dated values, or using rounded values or values reported differently by the governments themselves. Often, there is little transparency in the specific pledges being made, with different countries and channelling institutions publishing updated data with greatly differing frequencies. The information is presented in table form per country followed by a bar graph of total funding amounts for key channelling institutions.

Table 6 Overview of fast start finance and channelling institutions<sup>194</sup>

Country	Total Pledged by Country (USD million)	Channelling Institutions	Amount pledged to channelling institution by country (USD million)	Total Pledged to channelling institution (USD million)	Total Disbursed by channelling institution (USD million)
<b>Australia</b>	637	International Climate Change Adaptation Initiative	262.63	262.63	
		International Forest Carbon Initiative	154.63	216.27	47.60
		Climate Change Partnerships for Development	38.13		
		Global Environment Facility	40.25		
		Australian Support to MDBs for Adaptation and Mitigation	138.78		
<b>Belgium</b>	212	Least Developed Countries Fund	14.17	262.28	92.29
		Sustainable Forest Management/REDD+ Program	14.17		
		Belgian Investment Company for Developing Countries	28.34		
<b>Canada</b>	409	Global Environment Facility	18.93		
		Least Developed Countries Fund	20.46	262.28	92.29

<sup>194</sup> Sources: (i) Faststartfinance.org, available at <http://www.faststartfinance.org/content/contributing-countries>; (ii) World Resources Institute, available at [http://pdf.wri.org/climate\\_finance\\_pledges\\_2011-05-09.pdf](http://pdf.wri.org/climate_finance_pledges_2011-05-09.pdf); and (iii) Climate Funds Update, available at <http://www.climatefundsupdate.org/graphs-statistics/pledged-deposited-disbursed>.



Country	Total Pledged by Country (USD million)	Channelling Institutions	Amount pledged to channelling institution by country (USD million)	Total Pledged to channelling institution (USD million)	Total Disbursed by channelling institution (USD million)
		International Development Research Centre	10.23		
		Climate Change Adaptation Initiatives through Existing Partners	5.11		
		Vietnam's National Target Program on Climate Change	3.07		
		International Finance Corporation	292.22		
		Forest Carbon Partnership Facility	40.91	221.27	10.34
<b>Denmark</b>	227	Least Developed Countries Fund	15.21	262.28	92.29
		Climate Investment Funds – Pilot Program for Climate Resilience	5.70	971.75	7.72
		Climate Investment Funds – Forest Investment Program	5.13		
		UN-REDD <sup>195</sup>	6.00	221.27	10.34
		Forest Carbon Partnership Facility	0.27	221.27	10.34
		Pilot Program on Adaption – Securing Coasts and Water Resources	0.94		
<b>European Union</b>	212	Global Climate Change Alliance - Ethiopia	11.32	226.12	20.51
		Increasing Climate Resilience of Pacific Small Islands through the GCCA	14.15		
		EU-UNDP Climate Change Capacity Building Program	11.33		
		Forest Carbon Partnerships Facility's Readiness Fund	5.67		
		EU REDD Facility	4.24		
<b>Finland</b>	156	Adaptation Learning Program for Africa	2.33		
		Global Environment Facility	16.41		
<b>France</b>	1,781	Indonesia's Climate Change Program Loan	201.04		
		Reforestation Program in the Yunnan Province of China	49.53		
		Rubber Trees Plantation	19.82		

<sup>195</sup> The UN-REDD 2010 year in review report states that Denmark committed 6 million; see <http://www.un-redd.org/Publications/tabid/587/Default.aspx>.



Country	Total Pledged by Country (USD million)	Channelling Institutions	Amount pledged to channelling institution by country (USD million)	Total Pledged to channelling institution (USD million)	Total Disbursed by channelling institution (USD million)
		Improvement of Yield from the Water Network in Morocco	14.16		
		Sustainable Management of Forests in the Democratic Republic of Congo	7.08		
		Global Environment Facility	18.40		
<b>Germany</b>	1,781	Fondo de Biodiversidad Sostenible	8.49		
		Climate Investment Funds – Pilot Program for Climate Resilience	11.33	971.75	7.72
		Forest Carbon Partnership Facility	48.16	221.27	10.34
		Adaptation Fund	14.17	216.16	9.46
		Special Climate Change Fund	3.82	149.28	73.51
		Other Multilateral	10.62		
<b>Iceland</b>	1				
<b>Japan</b>	15,000	Japan Bank of International Cooperation and Nippon Export and Investment Insurance Report for Counter-Risk Measures	7.8		
<b>Luxembourg</b>	13	Adaptation Fund	1.41	216.16	9.46
		UN-REDD Program	1.41	126.04	51.36
		Global Facility for Disaster Reduction and Recovery	1.41		
<b>Malta</b>	1	Miscellaneous Institutions			
<b>The Netherlands</b>	438	Energising Development (Bangladesh, Benin, Bolivia)	96.35		
		Public-Private and NGP Partnerships	104.86		
<b>Norway</b>	1,000	Tanzania	17		





Country	Total Pledged by Country (USD million)	Channelling Institutions	Amount pledged to channelling institution by country (USD million)	Total Pledged to channelling institution (USD million)	Total Disbursed by channelling institution (USD million)
		Indonesia	30		
		Mexico	7		
		Guyana REDD and Investment Fund	30		
		Brazil – Amazon Fund	142		
		UN-REDD Program	33	126.04	51.36
		Climate Investment Funds – Forest Investment Program	48	559.10	3.00
		Multilateral Development Banks	5.3		
		Forest Carbon Partnership Readiness Fund	11		
		Least Developed Countries Fund	4.1	262.28	92.29
		Special Climate Change Fund	2.5	149.28	73.51
		Congo Basin Forest Fund	32	165.00	11.72
<b>Slovenia</b>	11	Miscellaneous Institutions			
<b>Spain</b>	530	Adaptation Fund	63.80	216.16	9.46
		GEF Africa Sustainable Forestry Fund	28.35		
		GEF Trust Fund	18.43		
		Special Climate Change Fund	5.67	149.28	73.51
		UN-REDD Program	1.42	126.04	51.36
		Inter-American Development Bank	39.70		



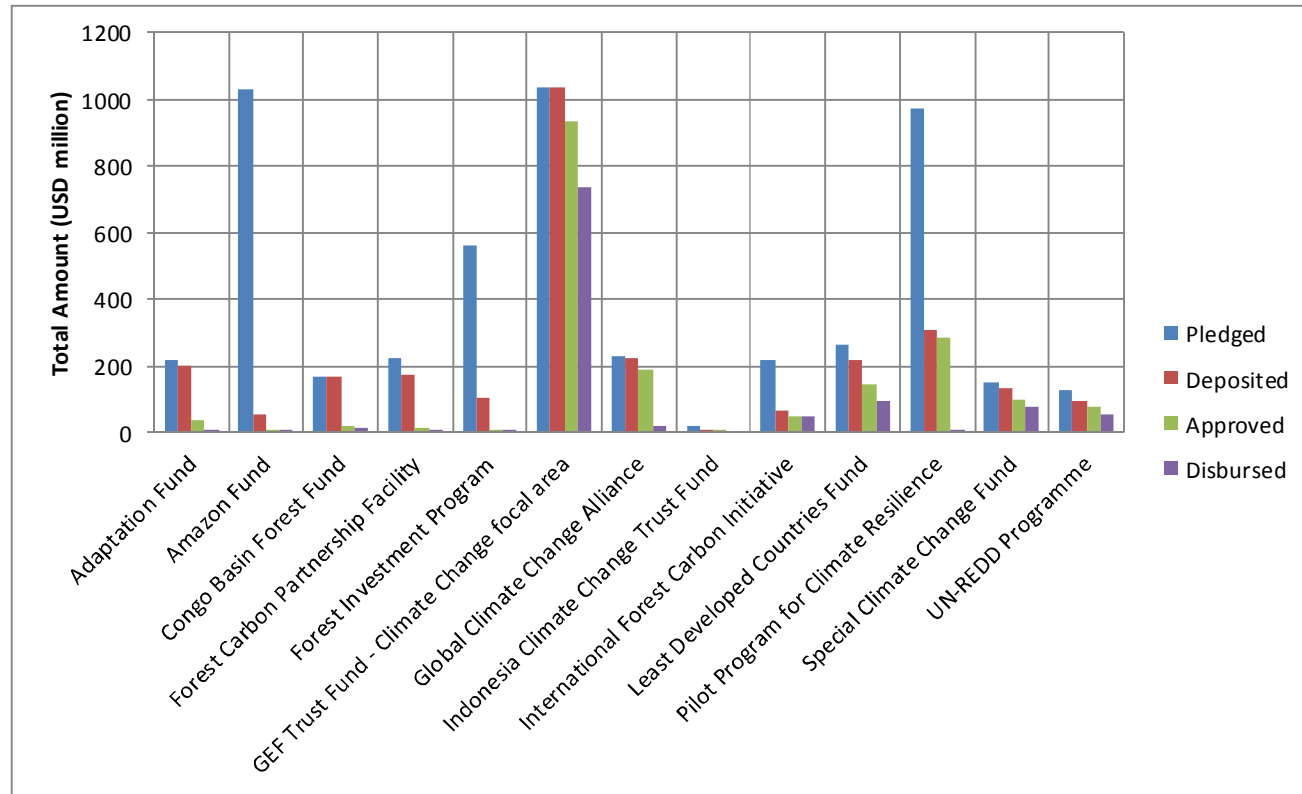
Country	Total Pledged by Country (USD million)	Channelling Institutions	Amount pledged to channelling institution by country (USD million)	Total Pledged to channelling institution (USD million)	Total Disbursed by channelling institution (USD million)
<b>Sweden</b>	1,131	Cambodia Climate Change Alliance	4.14		
		International Union for Conservation of Nature – Adaptation Fund (Burkina Faso)	3.18		
		GEF – Additional Contribution for Mitigation	2.70		
		GEF – Replenishment Fund	2.39		
		GEF- Additional Contribution for REDD	1.75		
		Adaptation Fund	1.75	216.16	9.46
		Consultative Group on Agriculture and Research	0.79		
		International Strategy for Disaster Reduction	0.64		
		Various Multilateral Channels in Support of Adaptation	4.78		
<b>Switzerland</b>	162	Global Environment Facility	17.24		
<b>United Kingdom</b>	2,458	UK Department for International Development	30.10		
		Climate Investment Funds – Pilot Program for Climate Resilience	329.32	971.75	7.72
		Climate Investment Funds	252.68	4,405.00	227.00
		Climate Investment Funds – Foreign Investment Program	102.70		
		Congo Basin Forest Fund	57.05	165.00	11.72



Country	Total Pledged by Country (USD million)	Channelling Institutions	Amount pledged to channelling institution by country (USD million)	Total Pledged to channelling institution (USD million)	Total Disbursed by channelling institution (USD million)
		Global Environment Facility – Climate Change Element			
		Forest Carbon Partnership Facility	16.30	221.27	10.34
<b>U.S.A</b>		Climate Investment Funds – Pilot Program for Climate Resilience	55	971.75	7.72
		Climate Investment Funds – Foreign Investment Program	20		
		Forest Carbon Partnership Facility	10	221.27	10.34
		Least Developed Countries Fund	30	262.28	92.29
		Special Climate Change Fund	20	149.28	73.51
		Global Environment Facility	37		



Figure 1: Overview of fast start channelling agencies from table 5 by agency and amount of funds <sup>196</sup>



<sup>196</sup> Values from <http://www.climatefundsupdate.org/>.