

## Synergies across a REDD+ landscape

### Non-carbon benefits, joint mitigation and adaptation, and an analysis of submissions to the SBSTA

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International policy makers are currently exploring methodological matters associated with non-carbon benefits and joint mitigation and adaptation approaches as they relate to REDD+. Although few pilot projects are exploring these issues, emerging evidence shows how these approaches can be implemented on the ground. This analysis draws from the scientific literature on non-carbon benefits and joint mitigation and adaptation, evaluates recent submissions to the SBSTA on these issues, and intends to inform the negotiations on these approaches.

#### Introduction

The fifth Intergovernmental Panel on Climate Change (IPCC) assessment reports clearly indicate the impacts that climate change has already had across the world (IPCC 2014a). Those include effects on water resources; shifts in the distribution, abundance and interactions of biodiversity; changes in agricultural productivity; and susceptibility to extreme climate events. The IPCC concludes that “adaptation and mitigation choices in the near-term will affect the risks of climate change throughout the 21st century” and has found that greater mitigation efforts are needed (IPCC 2014b).

The policy framework for reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries (REDD+) passed a major milestone at the 19th UN Framework Convention on Climate Change (UNFCCC) Conference of the Parties (COP).<sup>1</sup> At COP19, the Warsaw REDD+ Framework was decided, providing guidance on a variety of measures related to REDD+.<sup>2</sup> The UNFCCC Adaptation

Committee has also continued its work<sup>3</sup> with a major decision in 2013 to enhance adaptation efforts by developing linkages among relevant workstreams. This decision, however, does not specifically mention synergies with mitigation efforts such as REDD+.

Negotiations within the UNFCCC concerning policies on mitigation and adaptation have been undertaken along separate negotiating tracks. Actions on the ground, however, provide opportunities to implement adaptation and mitigation simultaneously. Mitigation activities can provide adaptation results, and some adaptation approaches can reduce emissions or increase sequestration. However, there are trade-offs between the two outcomes that will require careful consideration and decision making. In this context, it would be useful to take a holistic view concerning the technical elements of joint mitigation and adaptation in landscapes.

Within the political decision-making framework of the UNFCCC, the negotiations of the Subsidiary Body on Scientific and Technical Advice (SBSTA) have two agenda items that provide the space to discuss how such experiences could inform REDD+. The first is on the non-carbon benefits provided by REDD+.<sup>4</sup> Non-carbon benefits can provide a space for this conversation because joint mitigation–adaptation approaches can also give rise to non-carbon benefits. The second is the agenda item on joint mitigation and adaptation as a tool to achieve REDD+ without reliance on payments from carbon markets.<sup>5</sup>

1 <http://unfccc.int/resource/docs/2013/cop19/eng/10a01.pdf>

2 <http://unfccc.int/resource/docs/2013/cop19/eng/10a01.pdf>

The Warsaw REDD+ framework decided on: the technical assessment of proposed reference levels; modalities for monitoring, measuring, reporting and verifying emissions reductions; and the timing and channel for reporting on safeguard information systems. Furthermore, the decision invited the designation of REDD+ national focal points to share lessons on coordinating international financing; requested the Green Climate Fund (GCF) to channel results-based finance based on previous REDD+ related decisions; agreed that results-based financing should be provided only after information on addressing and respecting safeguards has been provided; and established a web-based hub to gather information on emissions reductions results and any results-based payments.

3 <http://unfccc.int/resource/docs/2013/cop19/eng/10a02.pdf>

The Adaptation Committee, established in 2010, has five goals: providing technical support and guidance, sharing information, promoting coordinated action, providing guidance on incentivizing action, and considering Party actions on adaptation.

4 1/CP.18, paragraph 40. <http://unfccc.int/resource/docs/2012/cop18/eng/08a01.pdf>

5 FCCC/SBSTA/2013/3, paragraph 40. <http://unfccc.int/resource/docs/2013/sbsta/eng/03.pdf>

### Box 1. Examples of joint mitigation and adaptation and trade-offs.

Planning, implementing and financing activities that achieve both mitigation and adaptation benefits on the ground may provide a more effective and equitable approach than those that approach ecosystems from one or other angle in isolation (Robledo et al. 2005). Here we provide three examples of possible REDD+ joint mitigation and adaptation activities: reducing emissions from fires and creating ecosystem and livelihood benefits; protecting and restoring mangrove ecosystems whilst building resilience to climate change; and mitigation through agroforestry which enhances food security. Other examples, not discussed in this paper, include the practice of conservation agriculture (Verhulst et al. 2012), multicropping (Harvey et al. 2014) and watershed protection through vegetation cover and soil management (Pramova et al. 2012).

#### ***Reducing emissions from fires and creating ecosystem and livelihood benefits***

Across landscapes, fires burn vegetation and sometimes the carbon stored in soils, causing large emissions of greenhouse gases (IPCC 2014b). While some forest ecosystems such as savanna forests need fires to maintain their functions, fires negatively affect others. The frequency and intensity of wildfires in many forests have been increasing. For example, some Amazonian regions are now affected by fire every 5–15 years (Alencar et al. 2006) instead of the former fire rotation thought to be in the hundreds or thousands of years (Cochrane et al. 1999). In ecosystems not adapted to fires, or those where regrowth does not match the biomass lost in the fire, fires can reduce ecosystem services such as carbon storage (IPCC 2014b).

Fires in Indonesia are a major source of greenhouse gas emissions and atmospheric pollution. The environmental damage associated with these fires, and the negative impact of the resulting haze and aerosols for human health, transport, tourism and economic activity have made them a cause of major international concern (Gaveau 2014). Globally, landscape fires are ignited from a range of causes – from lightning strikes to humans clearing areas for agriculture (Gaveau 2014), and fire risk and hazard may be exacerbated by climate change (Westerling et al. 2006).

Addressing these causes and increasing community resilience to fire can mitigate climate change and generate adaptation and non-carbon benefits on the ground, for both ecosystems and communities. Through our analyses of Party and observer submissions to the Subsidiary Body on Scientific and Technical Advice (SBSTA) we have identified that improvements in health and fire prevention are recognized as REDD+ non-carbon benefits.<sup>a</sup>

#### ***Protecting and restoring coastal wetlands and building resilience to climate change***

Coastal tropical forests (mangroves and peatlands) are extremely carbon-rich in both their vegetation and soils (Murdiyarso et al. 2012). However, many coastal areas are already experiencing the effects of climate change. Increased levels of sea flooding, accelerated coastal erosion and seawater intrusion into freshwater sources are expected to be exacerbated. Coastal ecosystems, coastal settlements and island states are exposed to increasing negative pressures (IPCC 2014a).

Functioning coastal forests have also been shown to protect coasts from damage during strong storms. These ecosystems can improve water quality, provide habitat for fish and shellfish, supply wood and other forest products to local communities, and promote plant, animal and insect biodiversity (Murdiyarso et al. 2012). Extensive mangrove restoration efforts have been undertaken in Southeast Asia, however, they have mostly focused on the economic losses associated with avoiding coastal forest degradation (Macintosh et al. 2011).

Efforts to protect and restore coastal wetlands can contribute to both mitigation and adaptation outcomes (Murdiyarso and Kauffman 2011). Synergizing carbon sequestration through coastal forest restoration with activities to help communities plan and prepare for climate impacts could work hand-in-hand if both mitigation and adaptation outcomes were set as goals.

#### ***Mitigation through agroforestry and enhancing food security***

Agroforestry, the practice of growing trees within agricultural systems, can store more carbon than annual cropping systems or pastures alone (Verchot et al. 2005). In addition to the carbon mitigation benefits, agroforestry systems can also provide food during crop failures and provide additional ecosystem services (Verchot et al. 2005).

These systems are most commonly used in Central America for crops like coffee and cocoa (Harvey et al. 2014) – commodities sold internationally and not used for on-farm sustenance.

#### **Trade-Offs**

There are often trade-offs between selecting mitigation and adaptation activities, in that mitigation projects may hinder the adaptation of local communities, and some adaptation projects can alter ecosystems and their carbon sequestration potential (Locatelli et al. 2011). For example, in an agroforestry context, farmer decisions about tree species and management approaches can increase the resilience of the farming system, but not necessarily carbon (Murdiyarso et al. 2005). A further example is that of forest conservation projects aimed at achieving mitigation, which may hinder local community access to natural resources (Locatelli 2010).

a See EU submission on non-carbon benefits, FCCC/SBSTA/2014/MISC.4, page 27. <http://unfccc.int/resource/docs/2014/sbsta/eng/misc04.pdf>

## Analysis of Party and observer submissions

The COP recently invited Parties and observers to submit their views on methodological guidance for non-carbon benefits<sup>6</sup> and non-market approaches,<sup>7</sup> including joint mitigation and adaptation. Non-market approaches represent an avenue of finance to support REDD+ through means not associated with carbon markets, for example via funding through the Green Climate Fund. Joint mitigation and adaptation has been proposed as an appropriate approach to non-market-based REDD+.

In response to the call for submissions, 18 were entered on non-carbon benefits: 11 from Parties and 7 from observers. Ten submissions were presented on non-market approaches and joint mitigation and adaptation: 7 from Parties and 3 from observers.<sup>8</sup> The Secretariat has compiled Party submissions on non-carbon benefits in FCCC/SBSTA/2014/MISC.4<sup>9</sup> and non-market approaches, including joint mitigation and adaptation in FCCC/SBSTA/2014/MISC.3.<sup>10</sup>

Table 1 provides a list of the key proposals from submissions on both topics, and indicates the number of submissions, identifying the Parties and observers that raised these ideas. There were also some perspectives that were not reflected in the majority of submissions, and some that were in direct opposition to each other. For example, two submissions ask the UNFCCC to define non-carbon benefits and establish a value for them – this is contrary to the majority position on nationally determined non-carbon benefits. Other ideas were mentioned by a small number of submissions, but provide proposals that may be non-controversial, and therefore easily incorporated into the negotiations. For example, the suggestion that countries voluntarily submit information on non-carbon benefits to the online REDD+ information hub or to safeguards information systems could be supported by those Parties interested in doing so on a voluntary basis.

Party submissions on non-carbon benefits ranged from short (176 words) to lengthy (1757 words). Observer submissions on this issue were longer, ranging from 1006 to 2558 words. Party submissions on non-market approaches, including joint mitigation and adaptation ranged from very short (81 words), to lengthy (2625 words), and again, observer submissions on this issue were longer, ranging from 895 to 3259 words.

We have analyzed the submissions in two ways. First, we identified the elements that were more commonly mentioned in a majority of submissions. Second, we screened the submissions for ideas that reflect the growing body of experience on these issues, even if these ideas were not brought forward by a majority of submissions. By proceeding this way we hope to

provide insight on both the opinion of the majority as well as of innovative minority voices.

A number of elements commonly appeared in these submissions from both Parties<sup>11</sup> and observers<sup>12</sup> that could contribute to the UNFCCC negotiations on these issues. These included the following:

### Identifying elements of joint mitigation and adaptation in the forest sector, outside of the political conversation on non-market approaches.

Of submissions on non-market approaches, 80% were of the view that REDD+ implementation presents many opportunities for synergistic approaches that achieve adaptation results while mitigating climate change. One submission provided a proposed series of actions within a country to implement joint mitigation and adaptation. However, others pointed to the complexity of joint mitigation and adaptation approaches, and did not include details as to how they would be implemented. Many submissions pointed to the need for better technical understanding on how to operationalize joint mitigation and adaptation on the ground; however, only one submission provided any specific evidence, case studies or technological analysis of this point. There is disagreement among Parties as to whether international guidance on joint mitigation should be developed, and the submissions provided limited data to further the technical understanding on the issue.

### The close link between safeguards and non-carbon benefits.

The Cancun Agreements<sup>13</sup> established social, environmental and governance safeguards for REDD+, and many submissions mentioned the plethora of non-carbon benefits that are related to safeguards, including: securing land tenure,<sup>14</sup> enhancing respect for indigenous peoples and their knowledge, protecting biodiversity, supporting livelihoods, and maintaining provision of ecosystem services. Of submissions, 78% were of the view that safeguards and non-carbon benefits are closely linked in REDD+ implementation, but provided little detail as to how they can be integrated at the international level.

### The success of REDD+ is dependent on the provision of non-carbon benefits.

This is one of the strongest areas of agreement, with 83% of the submissions mentioning this. In this context, Parties and observers conclude that non-carbon benefits need to be included in REDD+ enabling conditions, that provision of non-carbon benefits will increase interest in REDD+, that indigenous peoples and communities play a role in both REDD+ implementation and the provision and receipt of non-carbon benefits, and that non-carbon benefits can yield ecosystem services.

6 1/CP.18, paragraph 40. <http://unfccc.int/resource/docs/2012/cop18/eng/08a01.pdf>

7 1/CP.18, paragraph 39. <http://unfccc.int/resource/docs/2012/cop18/eng/08a01.pdf>

8 As of 12 May 2014.

9 <http://unfccc.int/resource/docs/2014/sbsta/eng/misc04.pdf>

10 <http://unfccc.int/resource/docs/2014/sbsta/eng/misc03.pdf>

11 [http://unfccc.int/documentation/submissions\\_from\\_parties/items/5901.php](http://unfccc.int/documentation/submissions_from_parties/items/5901.php)

12 [http://unfccc.int/documentation/submissions\\_from\\_observers/items/7482.php](http://unfccc.int/documentation/submissions_from_observers/items/7482.php)

13 <http://unfccc.int/resource/docs/2010/cop16/eng/07a01.pdf#page=2>

14 A recent Center for International Forestry Research (CIFOR) global comparative study of 23 REDD+ project sites across Brazil, Cameroon, Indonesia, Peru, Tanzania and Vietnam has identified unclear and unstable tenure and the disadvantageous economics of REDD+ as the biggest challenges faced in moving forward with REDD+ (Sunderlin et al. 2014).

**Table 1. Summary of proposals from Party and observer submissions on non-carbon benefits and non-market approaches.**

Proposal	Number of instances	Parties and observers
<b>Non-carbon benefits (18 submissions)</b>		
REDD+ success is dependent on provision of non-carbon benefits	10 Parties 5 observers	ASEAN, Brazil, China, COMIFAC, EU, Malaysia, Norway, Philippines, Tunisia, USA CI et al., COICA, IWGIA et al., RSWG, WWF
Safeguards and non-carbon benefits are linked	9 Parties 5 observers	Brazil, China, COMIFAC, EU, Japan, Malaysia, Norway, Philippines, USA CI et al., IWGIA et al., RSWG, Tebtebba, WWF
Non-carbon benefits should be determined at the national level	7 Parties 4 observers	ASEAN, Brazil, China, Malaysia, Norway, Philippines, USA CI et al., RSWG, Tebtebba, WWF
Indigenous peoples depend on non-carbon benefits	3 Parties 6 observers	EU, Philippines, Tunisia AIPP, COICA, IWGIA et al., RSWG, Tebtebba, WWF
Synergies between UNFCCC and other related conventions can promote non-carbon benefits	6 Parties 4 observers	COMIFAC, EU, Norway, Philippines, Tunisia, USA AIPP, IWGIA et al., Tebtebba, WWF
Existing methodologies can be used to assess non-carbon benefits	4 Parties 4 observers	ASEAN, COMIFAC, Philippines, Tunisia IWGIA et al., RSWG, Tebtebba, WWF
Develop a composite approach to REDD+ payments that integrates non-carbon benefit payments	1 Party 4 observers	COMIFAC CI et al., COICA, RSWG, WWF
Indigenous peoples contribute to generating non-carbon benefits	4 observers	AIPP, COICA, IWGIA et al., Tebtebba
Develop international indicators or criteria for non-carbon benefits	3 Parties 1 observer	COMIFAC, Philippines, Tunisia RSWG
Provide capacity building to assess non-carbon benefits	1 Party 2 observers	ASEAN RSWG, Tebtebba
Leverage community knowledge to monitor non-carbon benefits	1 Party 4 observers	Philippines AIPP, IWGIA et al., RSWG, Tebtebba
Ensure non-carbon benefits do not outweigh mitigation results	2 Parties 1 observer	ASEAN, Malaysia Tebtebba
There is a link between non-carbon benefits, ecosystem adaptation and resilience	1 Party 2 observers	Tunisia RSWG, WWF
Prioritize REDD+ funding to activities that promote non-carbon benefits	2 Parties 1 observer	COMIFAC, USA RSWG
Identify additional financing sources to pay for non-carbon benefits	1 Party 1 observer	EU CI et al.
Avoid the use of non-carbon benefits to penalize REDD+ outcomes or alter mitigation results based on non-carbon benefits	2 Parties	ASEAN, Brazil
Establish a dialogue with indigenous peoples on non-carbon benefits	2 observers	AIPP, IWGIA et al.
Define and establishing a value for non-carbon benefits at the UNFCCC	2 Parties	COMIFAC, Tunisia
Assessment of non-carbon benefits varies for each benefit	2 Parties	COMIFAC, Malaysia
Design REDD+ national plans to maximize non-carbon benefits	1 Party	EU
Include information on non-carbon benefits in REDD+ information hub	1 Party	COMIFAC
REDD+ payment should not be contingent on performance in non-carbon benefits	1 Party	Norway

Proposal	Number of instances	Parties and observers
<b>Non-market approaches and joint mitigation and adaptation (10 submissions)</b>		
Identify elements of joint mitigation and adaptation in the forest sector	5 Parties 3 observers	ASEAN, Bolivia, China, Malaysia, Philippines Brighter Green, COICA, WWF
Host an in-session meeting on non-market approaches	2 Parties	ASEAN, Brazil
Establish methodological guidance at the UNFCCC for non-market approaches	2 Parties	Bolivia, LDCs
Non-market approaches only need additional guidance if they are to be implemented as joint mitigation and adaptation	1 Party	China
Non-market approaches are likely to deliver more equitable outcomes	1 Party	LDCs
Non-market approaches for REDD+ should be incorporated into the framework for various approaches and included in the 2015 agreement	1 Party	LDCs

**Note:**

AIPP – Asia Indigenous Peoples Pact  
 CI et al. – Conservation International and other organizations  
 ASEAN – Association of South East Asian Nations  
 COICA – The Coordination of Indigenous Organizations of the Amazon Basin  
 COMIFAC – The Central African Forest Commission  
 IWGIA et al. – International Work Group for Indigenous Affairs and other organizations

RSWG – REDD+ Safeguards Working Group  
 Tebtebba – Indigenous Peoples' International Centre for Policy Research and Education  
 WWF – World Wide Fund for Nature  
 LDCs – Least Developed Countries

**Non-carbon benefits should be determined at the national level.** Of submissions, 61% were of the view that due to their diversity, local importance, complexity or the inherent flexibility of REDD+, non-carbon benefits should be determined or defined at the national level, as opposed to being prescribed at the international level by the UNFCCC. In contrast, three submissions specifically called for international definitions and valuation of non-carbon benefits.

**The relationship indigenous peoples and local communities have with forests can provide important context for non-carbon benefits.** Indigenous peoples' and local communities' generation of and dependence on non-carbon benefits was a common theme among submissions. Of submissions, 53% raise the role of forests, including non-carbon benefits, in sustaining the livelihoods of indigenous peoples and local communities, and 24% refer to the role that these actors can play in helping achieve REDD+ outcomes. Two of the submissions propose that the SBSTA engage in a dialogue with indigenous peoples and gather lessons learned from their experiences.<sup>15</sup>

**The relationship between non-carbon benefits and the many existing international agreements on forests, conservation, biodiversity and indigenous peoples should be explored.** A number of existing international agreements overlap with

the UNFCCC when considering non-carbon benefits, such as the Convention on Biological Diversity and the UN Forum on Forests. Of submissions, 55% noted this relationship and called for synergies to be further explored.

The following elements reflect innovative ideas raised by a few submissions. These, too, could serve as a starting point for negotiations:

**The link between non-carbon benefits and joint mitigation and adaptation.** As an innovative issue raised by a minority, three submissions (1 Party and 2 observers) specifically made the connection between non-carbon benefits and adaptation. This should be considered in the context that a number of other submissions identify the role of REDD+ in providing ecosystem services as one of the most important non-carbon benefits, mostly in improving the effectiveness of REDD+.

**Sharing information on non-carbon benefit results.** Of submissions, 47% make the point that existing domestic REDD+ monitoring systems could serve as a tool to also identify non-carbon benefit results. Additionally, one submission suggested posting information on non-carbon benefits on the REDD+ information hub established by the Warsaw REDD+ Framework, and others called for the voluntary addition of non-carbon benefits to safeguard information systems. Voluntary monitoring and sharing of information on non-carbon benefit results could help Parties further understand how non-carbon benefits are operationalized, as well as provide information to those donors interested in promoting non-carbon benefits.

<sup>15</sup> See also UNFCCC decision 4/CP.15, paragraph 3, which encourages as appropriate, the development of guidance for effective engagement of indigenous peoples and local communities in monitoring and reporting. <http://unfccc.int/resource/docs/2009/cop15/eng/11a01.pdf> - page=11

## Box 2. Evaluation of existing experience in joint mitigation and adaptation projects.

Despite the large potential for synergies between mitigation and adaptation, few Adaptation Fund or Clean Development Mechanism projects report an explicit contribution to the other goal. This gap in experiences that provide sound demonstration of joint benefits for adaptation and mitigation can be explained by the cost of monitoring and the separation between adaptation and mitigation policies and funds, which do not incentivize climate project developers to seek and demonstrate a contribution to both adaptation and mitigation. A few adaptation project developers are interested in mitigation because of the prospect of carbon funding, whereas some mitigation project developers integrate adaptation to increase local acceptance and long-term sustainability or to meet certification criteria (Kongsager et al., forthcoming). A clear majority of climate fund managers foresee that the integration of adaptation and mitigation will become more important in the future, especially for benefits like carbon permanence, local relevance, and contribution to national priorities provided by including adaptation aspects in mitigation (Locatelli et al., forthcoming). Decision making on the balance between mitigation and adaptation, however, can be difficult and influenced by finances, power and control, knowledge, influence, and justice (Somorin et al. 2012).

Our research demonstrates the need for better knowledge and skills, early implementation of a monitoring system that is better adapted to the question of synergies, and practical tools and comprehensive guidelines for project implementers and decision makers. Furthermore, there is a need to document and disseminate best practice case studies and provide evidence on the benefits of integrating adaptation and mitigation, which funding organizations can contribute to. These organizations can also promote integration by revising their procedures and structures, ensuring that funded initiatives capture opportunities to provide multiple adaptation and mitigation benefits without excessively increasing project cycle complexity and costs. Incentive mechanisms and simplified procedures for accessing funding and reporting progress could play an important role in this.

Source: Based on an unpublished analysis by Kongsager et al. (forthcoming) and Locatelli et al. (forthcoming).

The findings of the mitigation and adaptation working groups for the fifth IPCC assessment report indicate the urgency of both deeply cutting climate change emissions and preparing to adapt to inevitable impacts. However, there is a growing body of technical knowledge on activities that achieve both mitigation and adaptation results across landscapes. The submissions from UNFCCC Parties and observers analyzed here show that these issues are important to policy makers as well as communities on the ground. However, neither Parties nor the majority of observers included examples from pilot projects, case studies or research on these issues.

Submissions from donor country Parties tended to reflect high-level support for non-carbon benefits and joint mitigation and adaptation, but indicated that these issues should be implemented and considered at the country-level, rather than through new agreements at the UNFCCC. REDD+ Party submissions varied in their treatment of these issues: some more closely resembled donor Party views on limiting these issues to domestic implementation, while others called for more detailed guidance on non-carbon benefits and joint mitigation and adaptation from the UNFCCC. Observer organization submissions reflected concrete thinking about how non-carbon benefits and joint mitigation and adaptation could be implemented for strong REDD+ results on the ground. Overall, very few submissions provided specific recommendations on decisions the UNFCCC could take on these issues, and those ideas that were put forward were echoed in few other submissions.

## Summary and next steps

This review suggests that Parties and observers consider the synergies among safeguards, non-carbon benefits, and mitigation and adaptation as critical to providing some of the best REDD+ results. Analysis of the submissions on non-carbon benefits and non-market approaches, including joint mitigation and adaptation, indicates that the following may advance the negotiations process:

- There is general agreement that non-carbon benefits are critical to the success of REDD+. Investments in these benefits could act as a risk-reduction tool for REDD+ mitigation results.
- While the majority of submissions called for non-carbon benefits to be determined within each country, and not by the UNFCCC, there was also disagreement on this issue. Therefore, negotiations could benefit from efforts to reach consensus specifically on this contentious point.
- Synergies between adaptation and non-carbon benefits are identified in the submissions; however, there is a lack of dialogue on adaptation as one of the major non-carbon benefits stemming from REDD+ implementation. Learning lessons about these synergies, and how to leverage adaptation efforts, could be helpful in more closely linking the two issues.
- The submissions reflect our current lack of experience in joint mitigation and adaptation activities. Funding holistic pilot activities may be useful to gather experience and learn lessons. Furthermore, such approaches can meet many of the of the proposed result areas of the Green Climate Fund, which are aimed at both mitigation and adaptation.
- The negotiations leading up to 2015 should continue to provide space for dialogue on how non-carbon benefits, including adaptation, can be holistically incorporated into forest mitigation activities.

## References

- Alencar A, Nepstad D and Diaz MDCV. 2006. Forest understory fire in the Brazilian Amazon in ENSO and non-ENSO years: Area burned and committed carbon emissions. *Earth Interactions* 10(6):1–17.
- Cochrane MA, Alencar A, Schulze MD, Souza CM, Nepstad DC, Lefebvre P and Davidson EA. 1999. Positive feedbacks in the fire dynamic of closed canopy tropical forests. *Science* 284:1832–35. doi:10.1126/science.284.5421.1832
- Gaveau D. 10 April 2014. Understanding haze. *The Jakarta Globe*. <http://www.thejakartaglobe.com/business/understanding-haze/>
- Harvey CA, Chacon M, Donatti CI, Garen E, Hannah L, Andrade A, Bede L, Brown D, Calle A, Chara J, et al. 2014. Climate-smart landscapes: Opportunities and challenges for integrating adaptation and mitigation in tropical agriculture. *Conservation Letters* 7(2):77–90.
- IPCC. 2014a. *Climate change 2014: Impacts, adaptation, and vulnerability. Contribution of working group II to the fifth assessment report of the Intergovernmental Panel on Climate Change*. Field C, Barros V, Mach K and Mastrandrea M, eds.
- IPCC. 2014b. *Climate change 2014: Mitigation of climate change. Contribution of working group III to the fifth assessment report of the Intergovernmental Panel on Climate Change*. Hernandez-Tejada T and Quadrelli R, eds.
- Kongsager R, Locatelli B, Chazarin F, forthcoming. *Addressing climate change mitigation and adaptation together: A global assessment of agriculture and forestry projects*.
- Locatelli B. 2010. *Local, global: Integrating mitigation and adaptation*. Perspective Forests/Climate Change No. 3. Paris: French Agricultural Research Centre for International Development (CIRAD).
- Locatelli B, Evans V, Wardell A, Andrade A and Vignola R. 2011. Forests and climate change in Latin America: Linking adaptation and mitigation. *Forests* 2(1):431–50.
- Locatelli B, Fedele G, Fayolle V and Baglee A, forthcoming. *Synergies between adaptation and mitigation in climate change finance*.
- Macintosh DJ, Epps MM and Abrenilla O. 2011. Ecosystem approaches to coastal resources management: The case for investing in mangrove ecosystems. In *Food for All: Investing in Food Security in Asia and the Pacific – Issues, Innovations, and Practices*. Asian Development Bank.
- Murdiyarto D and Kauffman JB. 2011. *Addressing climate change adaptation and mitigation in tropical wetland ecosystems of Indonesia*. Infobrief. Bogor, Indonesia: Center for International Forestry Research (CIFOR).
- Murdiyarto D, Kauffman JB, Warren M, Pramova E and Hergoualc'h K. 2012. *Tropical wetlands for climate change adaptation and mitigation: Science and policy imperatives with special reference to Indonesia*. Working Paper 91. Bogor, Indonesia: Center for International Forestry Research (CIFOR).
- Murdiyarto D, Robledo C, Brown S, Coto O, Drexhage J, Forner C, Kanninen M, Lipper L, North N and Rondón M. 2005. Linkages between mitigation and adaptation in land-use change and forestry activities. In Robledo C, Kanninen M and Pedroni L, eds. *Tropical Forests and Adaptation to Climate Change: In Search of Synergies*. Bogor, Indonesia: Center for International Forestry Research (CIFOR).
- Pramova E, Locatelli B, Djoudi H and Somorin O. 2012. Forests and trees for social adaptation to climate variability and change. *WIREs Climate Change* 3:581–96.
- Robledo C, Kanninen M, Pedroni L, eds. 2005. *Tropical Forests and Adaptation to Climate Change: In Search of Synergies*. Bogor, Indonesia: Center for International Forestry Research (CIFOR).
- Somorin OA, Brown HCP, Visseren-Hamakers IJ, Sonwa DJ, Arts B and Nkem JN. 2012. The Congo Basin forests in a changing climate: Policy discourses on adaptation and mitigation (REDD+). *Global Environmental Change* 22:288–98.
- Sunderlin WD, Ekaputri AD, Sills EO, Duchelle AE, Kweka D, Diprose R, Doggart N, Ball S, Lima R and Enright A, et al. 2014. *The challenge of establishing REDD+ on the ground: Insights from 23 subnational initiatives in six countries*. Occasional Paper 104. Bogor, Indonesia: Center for International Forestry Research (CIFOR).
- Verchot LV, Mackensen J, Kandji S, van Noordwijk M, Tomich T, Ong C, Albrecht A, Bantilan C, Anupama KV and Palm C. 2005. Opportunities for linking adaptation and mitigation in agroforestry systems. In Robledo C, Kanninen M and Pedroni L, eds. *Tropical Forests and Adaptation to Climate Change: In Search of Synergies*. Bogor, Indonesia: Center for International Forestry Research (CIFOR).
- Verhulst N, Govaerts B, Sayre KD, Sonder K, Romero-Perezgrovas R, Mezzalama M, and Dendooven L. 2012. Conservation agriculture as a means to mitigate and adapt to climate change: A case study from Mexico. In Wollenberg E, Tapio-Bistrom ML, Grieg-Gran M and Nihart A, eds. *Climate Change Mitigation and Agriculture*. Oxford, UK, Earthscan.
- Westerling AL, Hidalgo HG, Cayan DR and Swetnam TW. 2006. Warming and earlier spring increase Western US forest wildfire activity. *Science* 313(5789):940–43.



RESEARCH PROGRAM ON  
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