



Policy recommendations to SBSTA on Peatlands & REDD

On Mitigation potential, Drivers, MRV, Reference Levels and Safeguards

Wetlands International, 24 June 2011

Peatlands play a critical role in climate regulation, storing twice as much carbon as the entire world's forest biomass and emitting large amounts of carbon when drained. In undrained condition, peatlands provide diverse goods and services to local livelihoods, are rich in – often unique - biodiversity and play an important role in water regulation, with a clear link to climate change adaptation. Yet, they are being drained and cut at an alarming rate, especially the peat swamp forests in SE Asia, which – without rapid adequate action – will have been decimated in 2020.

REDD+ activities that reduce or avoid greenhouse gas emissions from peatsoil degradation can play a major role in combating climate change at relatively limited costs. REDD+ activities in peat swamp forests are those activities that reduce greenhouse gas emissions by conservation of undrained peatsoils and by rewetting of drained peatsoils.

This policy brief provides background and recommendations with regard to REDD+ modalities and guidelines to be developed by the SBSTA. Besides for forested peatlands, this information is also relevant for reducing emissions from non-forested peatlands which have a similarly high mitigation potential.

We provide input on the following requests to the SBSTA in the Cancun Agreement (CP.16):

1. Annex II (a): Work programme to identify LULUCF activities in developing countries, drivers of deforestation and forest degradation, associated methodologies to estimate emissions and removals from REDD+ activities and their mitigation potential
2. Annex II (b): Modalities relating to a national forest reference emissions level (par 71(b))
3. Annex II (b): Guidance relating to addressing safeguards in REDD (par 71(d))
4. Annex II (c): Modalities on MRV of anthropogenic forest-related emissions and removals

We highly appreciate your feedback and dialogue on the issues raised.

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Summary of key messages to the SBSTA:

1. Input to Annex II (a) on mitigation potential activities to reduce emissions in peatlands, drivers of peatland degradation and associated methodological issues

- Peat oxidation and peat fires in drained peatlands contribute 2 Gigaton CO₂ per year to the global anthropogenic CO₂ emissions. Half of this amount, i.e. 1 Gigaton, is released from drained peatswamp forests in Southeast Asia. Rehabilitation of degraded peatlands and prevention of further peatland degradation can avoid emissions of almost two Gigatons of CO₂ annually on a disproportionately small area of land.
- Priority activities to reduce emissions from peatlands include:
 - Conservation of undrained peatlands (includes preventing further drainage, revoking existing plantation concessions, directing plantations to already degraded mineral soils).
 - Restoration (rewetting + reforestation) of degraded and drained peatswamp forests in the tropics.
 - Restoration (rewetting) of drained peatlands in the temperate zone.
- The above priorities should be done within the overall priority of conservation and restoration of other forest types of the world and of reducing emissions from other land uses such as agriculture. The scope of REDD should expand to a broader AFOLU agenda. Across AFOLU peatlands should be treated as hotspots for climate change mitigation since they occupy a very small land area but have enormous importance as climate regulators.
- The main drivers of peatland drainage are agriculture (including palm oil), pulp wood production and peat mining. Almost all remaining peatswamp forests on Borneo and Sumatra are about to be converted to plantations, with other areas in Southeast Asia to follow. To avoid huge emissions, there should be a moratorium on converting still undisturbed peatswamp forests and not yet realized plantation concessions should be revoked. Supply chains must exclude pulp wood and palm oil from drained peatlands. To block existing and emerging loopholes, SBSTA should stress that soil and biomass carbon losses associated with bio-energy crop production are adequately accounted for, either in the energy or in the AFOLU sector. By decision of the CDM Board (Sept. 2010), plantations on peat soils are no longer supported by the Clean Development Mechanism.
- Measuring, Reporting and Verifying REDD+ activities should be consistent with the most recent IPCC guidelines, as adopted or encouraged by the COP. SBSTA should refer to *revisions to the 2006 guidelines* that are currently in progress. Thanks to new science being available, this revision will substantially modify the emission factors currently used to estimate emissions and removals from peatlands. Countries that lack capacity to use this guidance should be supported.
- Adequate techniques exist for measuring greenhouse gas fluxes and carbon losses from peatlands and various assessment methodologies are under development and being tested. A SBSTA work programme should consult running methodology development efforts to measure, report and verify emissions reductions from peatland rewetting and conservation, such as modelling and the use of various proxies for greenhouse gas emissions in place of direct on-site flux measurements.

2. Input to Annex II (b) on credible national reference levels for countries with peatland loss

- The current '*forest-bias*' obstructs adequate consideration of peatswamp forests in the UNFCCC and in REDD+. SBSTA must make countries aware of the important differences between peatswamp forests, i.e. forests on organic soil, and forests on mineral soil. Peatswamp forests contain in average 10 times more carbon per hectare (especially in their peat soil) than forests on mineral soil.

- In a business as usual scenario (without REDD+ activities) almost all remaining undrained and slightly drained peat swamp forests in SE Asia will within the next 2 decades be converted to deeply drained plantations, with massive additional carbon dioxide emissions as a result. Also in other parts of the world peatland drainage is ongoing.
- Emissions from deforested or drained peat swamps continue until the entire peat is depleted or until the original water level is re-installed and appropriate vegetation is restored. Peat swamps drained in the past thus continue to emit in the present and in the future. These emissions will thus be additional to those resulting from already drained areas. The result is that simply reducing conversion rates will only slow down the *increase* in emissions, but not result in emission reductions nor in the conservation of carbon stocks and biodiversity. **This has important consequences for emissions and stocks, see key messages under Section 2, page 9-10.**
- All peatsoils should be included in the baseline; both those of forested and those of deforested peat swamps and in expanded scope of REDD also non-forested peatlands. Deforested peat swamps are 'temporarily destocked' forests as they will naturally regenerate to forests in the absence of active management and fires. If these areas are not included in the baseline, emissions will continue but no incentive will be provided to reduce them. Furthermore, plantations will preferentially move to these lands leading to deeper drainage and larger emissions.

3. Input to Annex II (b) on guidance relating to addressing safeguards in peat forests

- SBSTA must provide guidance to defining forest degradation and include drainage of peat swamp forests in this definition.
- SBSTA must provide clear guidance to distinguish natural forests from forest plantations and ensure that REDD+ activities that convert natural ecosystems are not rewarded.
- SBSTA guidance must ensure that activities that drain native peatlands or adjacent areas are not rewarded under REDD+, including biofuel crop production activities on drained peatland or on peatland cleared of, or converted from, native ecosystems.
- In addition to guidance to avoid leakage *within* forest ecosystems, SBSTA should provide guidance to avoid displacement of emissions *to other natural ecosystems*, such as other wetlands.

4. Input to Annex II (c) on modalities for MRV-ing emissions and emissions reductions from peatland

- Under REDD+, countries must account for all carbon losses from all carbon pools (incl. peat soils!) unless transparent and verifiable information is provided that demonstrates that the pool is not a significant source.
- SBSTA shall establish criteria and procedures by which a pool or greenhouse gas source may be determined to be not significant and therefore does not have to be accounted for.
- The Cancun agreement makes reference to CP.4/15 to use the latest adopted IPCC guidelines. Thanks to new science being available, current work on the revision of the IPCC 2006 Guidelines will substantially modify the emission figures for countries with peatlands. Current emission factors are in a number of occasions far from realistic. Therefore REDD activities should be reported in accordance with the most recently adopted IPCC Guidelines *and* any subsequent clarifications agreed by the Conference of Parties.

Further information to our key messages as input to selected paragraphs of the Cancun Agreement

1. Mitigation potential activities to reduce emissions in peatlands, drivers of peatland degradation and associated methodological issues

Annex II (a): SBSTA has been requested (Annex II (a) Cancun Agreement) to identify land use, land-use change and forestry activities in developing countries, in particular those that are linked to the drivers of deforestation and forest degradation, to identify the associated methodological issues to estimate emissions and removals resulting from these activities, and to assess their potential contribution to the mitigation of climate change, and report on the findings to COP18 on the outcomes of the work.

This section is built up as following:

- A. Magnitude of emissions from land use activities in peatlands and priorities for and mitigation potential from REDD+ activities and NAMA actions
- B. Identification of the drivers of deforestation and degradation of tropical peatlands
- C. Methodological issues to estimate emissions and removals from tropical peatlands

A. Magnitude of emissions from land use activities in tropical peat soils and mitigation potential

While covering only three percent of the land area, the world's peatland soils contain nearly 30 percent (550 GT C)¹ of all soil-based carbon. This is twice the carbon stock in the total forest biomass of the world.

Draining lowers the water table in peatlands. As a result, the peat, i.e. the water saturated organic soil which had accumulated over thousands of years, is suddenly exposed to the air and turns into carbon dioxide (CO₂), which is released into the atmosphere. Drainage affects the drained site itself (e.g. the plantation) and the adjacent wetlands traversed by drainage canals or indirectly impacted by water level draw down.

Peat fires in drained peatlands cause similar emissions of carbon dioxide. Peat fires furthermore emit large quantities of soot (black carbon) into the atmosphere. Drained peatswamps are extremely vulnerable to fires. A small camp fire in a drained peatland area can cause a huge peat fire that can last for months (and even years), burning and smouldering thick layers of peat over large areas. Such incidences occur frequently and lead to notorious local and transboundary smoke haze as well as to enormous greenhouse gas emissions.

Peatland degradation (drainage + fires) results in emissions of 2 Gton CO₂/year from about 50 million hectares of degrading peatlands (15% of all the world's peatlands)², calculated with conservative estimates for peat fires. 50% of these total emissions come from drained and degraded peatswamp forests in developing countries (mostly SE Asia) which are directly relevant to REDD+.

Significant emissions reductions can be achieved. Below we describe the mitigation potential of a number of activities to reduce emissions from peatswamp forests.

¹Parish, F., Sirin, A., Charman, D., Joosten, H., Minayeva, T., Silvius, M. and Stringer, L. (Eds.) 2008. Assessment on Peatlands, Biodiversity and Climate Change: Main Report. Global Environment Centre, Kuala Lumpur and Wetlands International, Wageningen.

²Joosten, H., 2010. The Global Peat CO₂ Picture. Greifswald University & Wetlands International.

Conservation of undrained or slightly drained peatswamps under REDD+

Includes activities that prevent drainage of undrained, or deeper drainage of slightly drained peatlands, thereby reducing CO₂ emissions from avoided peat oxidation and fire incidence. Two types might be discerned:

- Avoiding *planned* peatland drainage that is legally authorized and documented to be implemented.
- Avoiding *unplanned* peatland drainage at the drainage frontier that is expected to expand in future as a result of improved access.

Mitigation potential

There are still about 12 million ha of relatively undisturbed peat swamp forests in SE Asia (cf. Miettinen et al. 2011³, Hooijer et al. 2010³) of which a large share is threatened to be converted, drained and possibly burnt over the next one or two decades. With a moratorium on conversion of these areas, 1 Gigaton of annual CO₂ emissions can be prevented. A large share of these peatlands is already licensed or planned to be drained for pulpwood and oil palm production. The only way to protect these peatlands is by revoking existing concessions. New oil palm and pulp wood plantations should shift to already degraded non-forest land on mineral soils.

Rewetting of drained peatsoils under REDD+

Includes practices that establish a higher water level on drained peatsoils, reduce net greenhouse gas emissions from peat oxidation, and may even re-install carbon sequestration through renewed peat accumulation.

Rewetting also reduces greenhouse gas emissions associated with anthropogenic peat fires. REDD+ activities on drained peatlands aiming at fire reduction without rewetting should not be eligible, because they are unlikely to be effective over the long term.

Mitigation potential

Of the ~27 mln ha of tropical peatlands in SE Asia 13 million ha had been deforested and mostly drained by 2006.⁴ Annually 1 Gt of CO₂ is emitted (oxidation + fires) from these currently degrading SE Asian peatswamp forest⁵. Fully restoring the 13 million ha of degraded peatsoils will not be feasible because many areas are covered with plantations. With the best efforts it might be possible to rehabilitate half of the area (0,5Gt CO₂/year).

Greenhouse gas emissions from existing plantations should be minimized by implementing more sustainable production techniques and technologies (including reducing drainage depth) in order to reduce the carbon footprint and the biodiversity impacts of the sector.

Peatland rehabilitation is an urgent measure to prevent the loss of carbon from the world's peat forests. If not restored, emissions from drained peatland areas may continue for decades or even hundreds of years (depending on the peat depth) until the entire carbon stock is gone.

Rewetting of peat soils can be combined with other climate activities such as Afforestation, Reforestation and Revegetation (by planting native and adapted tree or shrub species on rewetted peatland) or Agricultural Land Management (by applying adapted wet agriculture = paludiculture).

³ Miettinen et al. 2011. Deforestation rates in insular Southeast Asia between 2000 and 2010. *Global change Biology*.

⁴ Hooijer et al. 2010. Current and future CO₂ emissions from drained peatlands in Southeast Asia. *Biogeosciences*, 7, 1505-1514.

⁵ Joosten, H. 2010. The Global Peatland CO₂ Picture. Peatland status and drainage associated emissions in all countries of the World. Wetlands International, Ede

Protecting and restoring unforested non-tropical peatlands

Next to the 1 Gt of CO₂ emissions from SE Asian tropical peat swamps, another 1 Gt results from the 37 million ha of currently degrading non-tropical peatlands of the world⁶. This is a somewhat less concentrated but similarly substantial problem. Rehabilitation of 50% of this degraded area could lead to a mitigation of ~0.2Gt CO₂/year. This links clearly to Agriculture related to Climate Change Mitigation. In this context also the development and implementation of paludicultures (wet agricultures) as an alternative for drainage based peatland agriculture and forestry (together covering 70% of the drained peatlands) is urgent.

Summary key priorities for climate change mitigation in peatlands under REDD+

Rehabilitating some 20 million ha of degraded peatsoils worldwide and preventing degradation of another 13 million ha of SE Asian peat swamps will prevent emissions of almost two Gigatons of CO₂ annually. As this involves only a disproportionately small area of land, climate change mitigation in the land use sector should focus on these hotspots.

The key priorities for reducing emissions from forests and peatlands are:

1. Stop conversion of 12 million ha remaining peat swamp forests in SE Asia (net gain 1 Gt CO₂)
2. Restore half of the already drained peat swamp forests in SE Asia (net gain 0.5 Gt CO₂)
3. Restore half of the degraded peatlands in the temperate zone (net gain 0.2 Gt CO₂).

The above priorities should be done within the overall priority of conservation and restoration of other forest types of the world and of reducing emissions from other land uses such as agriculture. The scope of REDD should expand to a broader AFOLU agenda. Across AFOLU peatlands should be treated as hotspots for climate change mitigation since they occupy a very small land area but have enormous importance as climate regulators.

In the LULUCF negotiations a new accounting activity 'rewetting and drainage' was agreed in Cancun. Accounting for emissions (related to drainage) and removals (related to rewetting) from organic soils under the Kyoto Protocol applies to all art. 3.4 land uses (forest management, cropland management, grazing land management and revegetation).

B. Identifying the drivers of deforestation and degradation of tropical peatsoils

SBSTA has been requested to identify land use, land-use change and forestry activities in developing countries, in particular those that are linked to the drivers of deforestation and forest degradation (Annex II (a)). This section focuses on the drivers of peat swamp forest degradation.

Main driver: conversion to plantations for palm oil and pulpwood

In SE Asia over 13 million hectares of peat swamp forests are currently in a severely degraded state due to past logging and drainage for rice cultivation, timber trade, pulpwood and oil palm production and illegal logging. In addition, the largest share of the still relatively undisturbed peat swamp forests (most of which have been impacted by selective and illegal logging as well) is already allocated to be drained for pulpwood and oil palm production.

The rapid expansion of palm oil plantations takes place in the tropics due to increasing global demands for vegetable oil. Part of the expansion is a reaction to the expected opportunities and growth in the biodiesel market, both as a direct biofuel and as indirect reaction on the use of other vegetable oil

⁶ Joosten, H. 2010. The Global Peatland CO₂ Picture. Peatland status and drainage associated emissions in all countries of the World. Wetlands International, Ede

feedstocks for fuel⁷. About 4 million out of the total of 12 million hectares of palm oil concessions in SE Asia is on peatlands⁸; most of this is already in use.

Ongoing drainage of peatsoils for palm oil is causing soil subsidence and lasting emissions of up to 100 t CO₂/ha/year⁹ depending on drainage depth. Many of the peatlands turn into wastelands after some decades due to soil subsidence. Improved management (less deep drainage) can limit emissions to around 40 t CO₂/ha/year¹⁰.

These alarming emissions take place for the production of vegetable oil of only 3-4 tonnes/ha/year. If used for biofuels, these emissions cause about 600 tonnes CO₂ in order to produce just one TJ; compared to 81 tonnes CO₂/TJ for conventional oil fuel¹¹.

A further million of hectares or more of drained peat forests are covered with monoculture rubber, pulp wood and coconut, often in large-scale industrial and managed plantations (for instance in Sumatra¹²), which have similar high emissions. Whereas further investigation is needed to assess the scale and impact of palm oil and pulp wood plantations to forest and peatland degradation in more detail, there is sufficient insight for urgent action to prevent all SE Asian peat swamp forests to be degraded over the next one or two decades.

Illegal logging

A substantial part of the forests are subject to illegal logging for which canals are dug into the peat soil to enable transport of equipment and logs. The drainage depth of these canals is, however, limited and the drainage intensity lower than in oil palm plantations. The emissions are still significant, but much lower; on average 15 t CO₂/year¹³. Plantations on the other hand require a regular network of primary, secondary and tertiary canals, which are actively maintained and deepened to compensate for soil subsidence (from compaction and oxidation). Once areas are drained for palm oil production, emissions are much higher.

Legislation:

- National legislation in countries with tropical peat swamp forests does not protect peatlands.
- The Round Table on Sustainable Palm Oil (RSPO) tries to create a supply line of sustainable palm oil. Only 5% of all production is currently certified. This round table has, however, no criteria for greenhouse gas emissions nor for peatland use. Indirect Land Use Change is not addressed either. Currently (2010-2011) a greenhouse gas working group and a peatland working group are working on additional criteria.

⁷ European Commission, Joint Research Centre, 2010. Indirect land use change from increased biofuels demand.

⁸ Kaat, A., Silvius, M. March 2010. [Impacts of biofuel demands on carbon dioxide emissions from peatlands](#). Wetlands International, Ede

⁹ Couwenberg et al. 2010. *Global Change Biology* [16](#): 1715–1732. Greenhouse gas fluxes from tropical peatlands in south-east Asia; Hooijer et al. In *Biogeosciences*, 7, 1505-1514, 2010; Hooijer et al. 2011: Recent findings on subsidence and carbon loss in tropical peatlands: reducing uncertainties. Workshop on “Tropical Wetland Ecosystems of Indonesia: Science Needs to Address Climate Change Adaptation and Mitigation”, Bali, 11-14 April 2011; Jauhiainen et al. 2011. CO₂ emissions from acacia plantation on peatland in Sumatra, Indonesia. Workshop on “Tropical Wetland Ecosystems of Indonesia: Science Needs to Address Climate Change Adaptation and Mitigation”, Bali, 11-14 April 2011

¹⁰ Couwenberg et al. 2010. *Global Change Biology* [16](#): 1715–1732. Greenhouse gas fluxes from tropical peatlands in south-east Asia; Hooijer et al. In *Biogeosciences*, 7, 1505-1514, 2010; Hooijer et al. 2011: Recent findings on subsidence and carbon loss in tropical peatlands: reducing uncertainties. Workshop on “Tropical Wetland Ecosystems of Indonesia: Science Needs to Address Climate Change Adaptation and Mitigation”, Bali, 11-14 April 2011; Jauhiainen et al. 2011. CO₂ emissions from acacia plantation on peatland in Sumatra, Indonesia. Workshop on “Tropical Wetland Ecosystems of Indonesia: Science Needs to Address Climate Change Adaptation and Mitigation”, Bali, 11-14 April 2011

¹¹ Couwenberg, J. 2007, Biomass energy crops on peatlands: on emissions and perversions. IMCG-newsletter 2007-3 p.12-15

¹² Yumiko Uryu et al. July 2010. Sumatra's Forests, their Wildlife and the Climate Windows in Time: 1985, 1990, 2000 and 2009. WWF-Indonesia. Jakarta, Indonesia

¹³ Hooijer, A., Silvius, M., Wösten, H. and Page, S. 2006. PEAT-CO₂, Assessment of CO₂ emissions from drained peatlands in SE Asia. Delft Hydraulics report Q3943

- The EU Renewable Energy Directive (RED) excludes the use of biofuels produced on carbon rich wetlands or peatlands (cut off date 1-1-2008). RED in fact excludes the use of all palm oil from peat lands. RED, however, does not yet account for Indirect Land Use Change (ILUC). There is no certified palm oil supply line yet. As long as this is not in place, there is in fact no palm oil available meeting the RED requirements.

Key messages to SBSTA to address the drivers of degradation of peat forests:

- To protect the largest share of relatively undisturbed peat forests existing concessions (for pulp wood and palm oil plantations) must be revoked.
- Plantations should be shifted to already degraded mineral soils (based on adequate definition of degraded land).
- Palm oil and pulp wood supply chains must exclude products from drained peatlands, especially for use as 'biofuel' / biomass, because of unacceptable soil carbon emissions.
- SBSTA should note that the UNFCCC ensures that soil and biomass carbon losses associated with bio-energy crop production are accounted for either in the energy or in the AFOLU sector. By decision of the CDM Board (Sept. 2010), plantations on peat soils are already no longer supported by the Clean Development Mechanism (CDM).

C. Methodological issues related to assessing emissions/removals resulting from REDD+ activities in peatlands

SBSTA has been requested to identify the associated methodological issues to estimate emissions and removals resulting from REDD+ activities (Annex II (a)).

Credible methods for measuring, reporting and verifying (MRV) emissions and emissions reductions from peatlands are already available and data quality can be ensured. We provide an overview of available guidance and methodologies under development:

Guidance:

- IPCC guidelines for peatland rewetting: The IPCC2006 Guidelines provide guidance for reporting emissions from managed organic soils (= peatlands) and from wetlands. In 2010 the SBSTA started a work programme to improve the IPCC 2006 guidance with the aim to fill gaps for issues for which insufficient information was available when the IPCC2006 guidelines were compiled. SBSTA has thus requested IPCC to provide additional methodological guidance for the rewetting and restoration of peatland, for emissions from fires, ditches and waterborne carbon, and for constructed wetlands for waste water disposal. While the focus is on the wetland chapter (volume 4, chapter 7) of the IPCC 2006 Guidelines, drainage and conversion of wetlands to other land uses is included in other chapters of volume 4 (e.g., forest land, cropland and grassland) and therefore coherence between these chapters and the Wetland chapter should be maintained.¹⁴
- VCS: In March 2011 the VCS guidelines for Peatland Rewetting and Conservation (PRC) have been published. PRC provides standards to which methods for estimating and monitoring emissions and removals should comply. With this guidance methodologies can be developed for

¹⁴ IPCC. 2011. IPCC Expert Meeting on HWP, Wetlands and Soil N₂O eds: Eggleston H.S., Srivastava N., Tanabe K., Baasansuren J., and Fukuda M. Meeting Report of the IPCC Expert Meeting on HWP, Wetlands and Soil N₂O, Geneva, Switzerland, 19-21 October, 2010, Pub. IGES, Japan 2011

different activities (rewetting, revegetation, conservation) and different regions. Methodologies under PRC are under development (see below).

Methodologies:

In several countries in Europe (e.g. Belarus, Ukraine, Germany) and South-east Asia (Indonesia and Malaysia) practice-oriented proxy methodologies for estimating and monitoring emissions and removals from peatlands are under development. These methodologies base on water level, vegetation and subsidence and will enable measuring and reporting with higher Tiers. They are currently being pursued in research and pilot projects.

Practice-oriented proxy methodologies are most practical and most feasible, because the laborious and technically complex direct measurement of emissions and removals from peatlands is too expensive for standard monitoring. In practice, direct measurements are only feasible for selected pilot sites to develop, calibrate and verify proxy methodologies. Emissions from other sites must then be assessed by applying these methodologies. For reasons of practicality and verifiability (reproducibility) the proxy parameters must be based on simple indicators.

All three methodologies (based on water level, vegetation and subsidence) allow for immediate baseline setting and monitoring, because the proxy data can be immediately mapped and translated into greenhouse gas flux estimates. Accuracy of the estimates can later be improved after improved calibration of the proxies.

Our key messages to SBSTA:

- The most recent methodological guidance by the IPCC (including the revision to 2006 GL which is under development) should be followed by all Parties determining emissions and removals from REDD+ activities in peatlands.
- SBSTA should establish a work programme for joint effort (joint implementation) to support countries that lack capacity to use methodological guidance.
- A SBSTA work programme should consult running methodology development efforts to MRV emissions reductions from peatland rewetting and conservation, such as hydrological modelling and the use of other proxies for greenhouse gas emissions in place of direct on-site gas flux measurements.

2. Credible national reference levels for countries with peatland loss

Input to **Annex II (b)**: Request to the SBSTA to develop modalities relating to **paragraph 71 (b)**: **71 (b)**: 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;

There are a number of issues specific to peatlands that need to be taken into account when setting reference levels for countries with significant carbon stocks and emissions from peat forests which are translated in some key messages below:

Key messages for the SBSTA

- In a business as usual scenario (without REDD+ activities) almost all remaining undrained and slightly drained peat swamp forests in SE Asia will within the next 2 decades be converted to deeply drained plantations, with massive additional carbon dioxide emissions as a result.
- The current '*forest-bias*' obstructs adequate consideration of peat swamp forests in the UNFCCC and in REDD+. SBSTA must make countries aware of the important differences between peat swamp forests, i.e. forests on organic soil, and forests on mineral soil. Peat swamp forests contain in average 10 times more carbon per hectare (especially in their peat soil) than forests on mineral soil.
- Emissions from deforested or drained peat swamp forests continue until the entire peat is depleted or until the original water level is re-installed and appropriate vegetation is restored. Peat swamps drained in the past thus continue to emit in the present and in the future. This has important consequences for emissions and stocks:
 - If the rate of peat swamp conversion decreases, the emissions from converted peat swamps still increase, because the newly converted sites *add to* the continuing emissions from the earlier converted sites. Hence, simply reducing conversion rates will only slow down the *increase* in emissions, but not result in emission reductions nor in the conservation of carbon stocks and biodiversity.
 - If the rate of peat swamp conversion is reduced to zero (= no further conversion), the emissions from drained peat swamps do *not decrease* and the peat swamp carbon stock *continues to decline*.
 - If drained and degraded peat swamps are reforested without rewetting, net carbon emissions *continue*, because the carbon losses from the drained peat soil exceed carbon sequestration in the new forest biomass. As a result the peat swamp carbon stock *continues to decline*.
 - Only by stopping conversion of undrained peat swamps and simultaneously rewetting and reforesting already drained and degraded peat swamps, the emissions from drained peat swamps can be reduced.
 - Unless at least 80% (40 million ha) of the drained peatlands are adequately rewetted, the World's peatlands will continue to be net CO₂ emitters and the global peatland carbon stock will continue to decrease.
- All peatsoils should be included in the baseline; both those of forested and those of deforested peat swamps. Deforested peat swamps are 'temporarily destocked' forests as they will naturally regenerate to forests in the absence of active management and fires. If these areas are not included in the baseline, emissions will continue but no incentive will be provided to reduce them. Furthermore, plantations will preferentially move to these lands leading to deeper drainage and larger emissions.

3. Guidance relating to addressing safeguards in peat forests

Input to **Annex II (b)**: Guidance relating to addressing safeguards in REDD (**par 71(d)**):
71 (d): SBSTA develops modalities relating to a system for providing information on how the safeguards referred to in Annex I to this decision are being addressed and respected throughout the implementation of the activities referred to in paragraph 70, while respecting sovereignty.

A crucial part of the REDD+ mechanism is to ensure good environmental and social safeguards (as included in the Cancun Agreement Annex I).

This is crucial for reducing emissions from peatlands as:

- REDD+ may otherwise provide an adverse incentive to promote further drainage or conversion of peatlands to grow fast growing plantations resulting in larger but unaccounted net emissions.
- Peatlands are extremely valuable for the conservation of rare species and very important for groundwater recharge, regulation of atmospheric moisture and water retention¹⁵.
- Communities and indigenous peoples depend on sustainable use of peat swamp forest resources for their food security, but also for the survival of their cultures and as a basis for poverty reduction, health and safety. The alternatives to peatland degradation must be found in development. Local people should be able to finance their lives in alternative sustainable ways instead of being forced to deplete their natural resources. REDD+ activities should therefore provide incentives for responsible use of peatlands, by stimulating alternative livelihoods in peatlands, including fisheries and agriculture and agro-forestry with species that do not need drainage (paludiculture).
- Cooperation with the local stakeholders and the use of their traditional knowledge is a critical success factor for the conservation and restoration of peat swamp forests. This cooperation will also facilitate the sustainability of the REDD+ activities beyond the end of the activity.
- REDD+ activities should help, train and equip locals in preventing peatland fires (delivering equipment, building capacity), build expertise in closing drainage canals by building dams, provide alternative sources of income for locals, deal with smoke related public health issues in peatlands, set up reforestation activities (both natural forests and commercially important wood types) and provide guidance in developing infrastructure for the conservation of remaining peat swamp forests.

Key messages to the SBSTA:

With regard to addressing safeguards in REDD+ related to reducing emissions from peatlands, the UNFCCC should make effective use of the already available Peatland Rewetting and Conservation (PRC) project requirements under VCS. Modalities should provide guidance to ensure that:

- REDD+ activities that convert native ecosystems to generate greenhouse gas credits should not be rewarded;
- REDD+ activities that drain native ecosystems to generate greenhouse gas credits should not be rewarded. Provide guidance that evidence shall be provided that an area was not drained or converted to create greenhouse gas credits. Failing to demonstrate this should result in the REDD+ activity not being eligible;
- Peatland conservation activities must demonstrate that there is either no hydrological connectivity to adjacent areas, or where activities are hydrologically connected to adjacent areas, a buffer zone will be established to ensure hydrologically connected areas will not have a significant negative impact on the activity area, such as causing the water table in the activity area to drop, or otherwise impacting the hydrology of the activity area, resulting in higher greenhouse gas emissions (see VCS-PRC);
- (Biofuel) crop production activities on drained peatland or on peatland cleared of, or converted from, native ecosystems should not be rewarded. These peat forests have often little or no canopy cover left, but have large soil carbon stocks whose mobilisation should be prevented by rewetting

¹⁵ Parish, F., Sirin, A., Charman, D., Joosten, H., Minayeva, T., Silvius, M. and Stringer, L. (Eds.) 2008. Assessment on Peatlands, Biodiversity and Climate Change: Main Report. Global Environment Centre, Kuala Lumpur and Wetlands International, Wageningen.

and reforestation rather than the drained and deforested peatlands being converted to drained plantations.

- The potential for leakage shall be identified and assessed and these assessments will be subject to periodic review. In addition to guidance to avoid leakage within forest ecosystems, SBSTA should also provide guidance to avoid displacement of emissions to other natural ecosystems, such as other wetlands (which are extremely vulnerable for instance for biofuel crop production because of being rich of water and relatively remote with few tenure rights).

4. Modalities for MRV-ing emissions and emissions reductions from peat

Input to **Annex II (c)**: SBSTA develops as necessary, modalities for measuring, reporting and verifying anthropogenic forest-related emissions by sources and removals by sinks, forest carbon stocks, forest carbon stock and forest area changes resulting from the implementation of activities referred to in paragraph 70 of this decision, consistent with any guidance for measuring, reporting and verification of nationally appropriate mitigation actions by developing country Parties agreed by the Conference of the Parties, taking into account methodological guidance in accordance with decision 4/CP.15, for consideration by the Conference of Parties at its seventeenth session.

Our key messages to the SBSTA:

- Each non-Annex I Party should account for all changes in peat forest soils except when transparent and verifiable information is provided that the pool is not a source.
- SBSTA shall establish criteria and procedures by which a pool or greenhouse gas source may be determined to be not significant and therefore does not have to be accounted for.
- The Cancun agreement makes reference to CP.4/15 to use the latest adopted IPCC guidelines. Current work on the revision of the IPCC 2006 Guidelines will have a high impact on emission figures for countries with peatlands. Current emission factors are in a number of occasions far from realistic. Therefore we strongly recommend that REDD activities are reported in accordance with the most recently adopted IPCC Guidelines *and any subsequent clarifications agreed by the Conference of Parties.*