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Accounting for forests and land use change – new rules or more loopholes?

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Forests and land use change contribute approximately 12% of global GHG emissions,[1] and are included in the Kyoto Protocol (KP) under land use, land use change and forestry (LULUCF) and via Afforestation / Reforestation (A/R) projects in the clean development mechanism (CDM). Via these mechanisms, land-based emissions and removals can be counted towards meeting Party targets under the KP. However, there is a risk that accounting for sequestration in the land sector will undermine efforts to reduce emissions from fossil fuel sources.[2] The capacity of the land sector to remove and store CO_2 from the atmosphere is limited – the total potential for carbon storage in the land sector is minuscule compared with the stock of fossil fuels that could yet be burnt.[3] This means that discussions on accounting rules for the land sector should not take place under the erroneous assumption that fossil fuel emissions "can be offset in the long term by the uptake of CO_2 in land systems".[4]

Accounting rules pertaining to forest and land use change will be discussed at the 19th Conference of the Parties (COP 19) in Warsaw. There are four issues on the table, which have arisen due to concerns that LULUCF accounting rules under the KP create loopholes, which allow emissions to go unaccounted, and that eligibility rules around A/R projects in the CDM create a barrier to investment in forest projects.

In decision 2/CMP.7 on LULUCF, Parties to the KP established three work programmes under the SBSTA (Subsidiary Body for Scientific and Technical Advice):

- to explore more comprehensive accounting of LULUCF emissions by sources and removals by sinks (and report to CMP 9);
- to consider and, as appropriate, develop and recommend modalities and procedures for possible additional LULUCF activities under the CDM;
- to consider and, as appropriate, develop and recommend modalities and procedures for alternative approaches to addressing the risk of non-permanence under the CDM (with a view to forwarding a draft decision on the last two items to CMP 9).

Decision 2/CMP.7 also established definitions, modalities, rules and guidelines relating to LULUCF activities under the KP for application in the second commitment period. FCCC/SBSTA/2013/L.5 para 5 called for a "review of modalities and procedures for applying the concept of additionality," which will also form part of LULUCF discussions in Warsaw. Given these mandates were established under the CMP, any new rules developed would only be relevant to the third commitment period of the KP, the future of which is highly uncertain.

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[1] Van der Werf G, Morton D, De Fries R, Olivier J, Kasibhatla P, Jackson R, Collatz G, Randerson J (2009) CO_2 emissions from forest loss, *Nature Geoscience* **2** 737–8

[2] Using the land sector as an offset in accounting under the KP lessened the incentive to reduce fossil fuel emissions, from the stated 5% target to an effective 2%. See Höhne N et al (2007) The rules for land use, land-use change and forestry under the Kyoto Protocol — lessons learned for the future climate negotiations. *Environmental Science and Policy* **10** 353–369

[3] Mackey et al (2013) Untangling the confusion around land carbon science and climate mitigation policy. *Nature Climate Change* **3** 552-557

[4] Ibid

Some Parties (e.g. New Zealand, Indonesia)[5] have openly suggested that the SBSTA consideration of LULUCF issues could serve as proxy for discussions on how to address the land use, forestry and agriculture sectors under a post-2020 climate agreement. Other countries, such as China, have stated that the issues under this agenda item should be addressed in the context of the KP, and not beyond that.[6] ***Given the narrow participation and technical focus of LULUCF negotiations, discussions pertaining to the land sector in a post 2020 agreement are outside the mandate of this agenda item, and should wait until the appropriate framework to guide such discussions is established.***

Work programme on 'more comprehensive accounting'

Current LULUCF rules use an 'activity-based' approach for accounting for emissions and removals. Activity-based means accounting is done by counting emissions and removals of different activities (A/R, deforestation, cropland and grazing land management, etc). Accounting for some of these activities is mandatory, while for other activities accounting is voluntary (see box/annex: background on accounting). Since the activity-based approach to accounting was first adopted, many parties and observers have been advocating for a move to a more comprehensive approach. Most parties understand a 'more comprehensive approach to accounting' to mean:

- a land-based approach;
- a more inclusive activity-based approach; or
- a combination of the two.

A move to 'more comprehensive accounting' is perceived as a way to close the loopholes created in the rules for the first commitment period, where accounting is voluntary for some activities. However, there is a risk that accounting for all emissions from the land use sector, a far larger volume of emissions, would expand loopholes and exacerbate accounting errors. Comprehensive accounting therefore does not automatically solve the problems of the current approach.

Activity-based vs. land-based accounting

Activity-based accounting was largely developed to deal with the differentiation between managed and unmanaged land,[7] following the principle established in decision 16/CMP.1 that "the mere presence of carbon stocks be excluded from accounting." This differentiation has led to some of the perversities now seen in LULUCF accounting, where the distinction between managed and unmanaged lands allows Annex I Parties to exclude sources of emissions by declaring an area 'unmanaged', despite substantial emissions occurring from such areas.

A 'land-based' approach to comprehensive accounting would remove the distinction between managed and unmanaged lands: a country would need to account for all sources and sinks from all land-use sectors. Further, there would be no choosing between activities, as all activities would effectively be mandatory. More inclusive activity-based accounting would include additional activities as mandatory, as has happened in the second commitment period to the KP. Comprehensive accounting means that no land-use emissions could be ignored, which is currently possible under the activity-based approach. However, many parties believe that this exposes them to great risk - events outside of their control, such as forest fires or insect outbreak, could cause emissions far greater than their overall mitigation target. To deal with this, the concept of 'force majeure' has been proposed, where such 'natural disasters are excluded from accounting.' This does not however, exclude these emissions from the atmosphere.

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[5] See NZ LULUCF submission (25 February 2013) on more comprehensive accounting, which is framed with regard to "a future accounting approach for the land sector."
http://unfccc.int/files/documentation/submissions_from_parties/application/pdf/2013_updated_submission_on_kp_art_578_to_unfccc_sbsta_feb_2013.pdf

[6] See China LULUCF submission (27 September 2013):
http://unfccc.int/files/methods/lulucf/application/pdf/20130926_subm_china_lulucf_sbsta39.pdf

[7] The Marrakesh Accords define "forest management" as a system of practices for stewardship and use of forest land aimed at fulfilling relevant ecological (including biological diversity), economic and social functions of the forest in a sustainable manner. (FCCC/CP/2001/13/Add.1, p. 58). Unmanaged lands are those considered remomote areas of land in a natural or primary condiiton, subject to ecological processes and with minimal human interference.

What should happen under the work programme on more comprehensive accounting?

While some believe that comprehensive accounting will give a more accurate picture of emissions/removals, in reality, given the uncertainties and difficulties in accounting terrestrial emissions, it could open more loopholes and increase the potential to game the system. It is not possible to account for land use sector emissions with the same degree of certainty as industrial emissions, meaning that the inclusion of both sectors in the same accounting framework undermines the verifiability of mitigation targets. Moving to more comprehensive accounting would only exacerbate this problem, even if it solved perversities related to the differentiation of managed and unmanaged lands. For this reason, the WGBU recommended that 'as few sinks as possible should be permitted for accounting, as each credited sink considerably hampers the verifiability of the reduction commitments.'[8]

Forests and the land sector in the CDM

Additional CDM activities

The CDM is the only mechanism under the KP which non-Annex 1 countries can participate in. Inclusion of the land sector in the CDM was limited to Afforestation and Reforestation (A/R) projects, largely due to concerns over the permanence and verifiability of emissions reductions and sequestration from the land sector.

However, there has been very limited uptake of LULUCF projects in the CDM, resulting in a lack of CDM finance flows to the poorest and most vulnerable countries, who are largely dependent on agriculture and forestry, with limited energy and industrial sectors. Nepal, on behalf of the LDC group, has suggested that improved cropping and revegetation should be considered for inclusion as additional LULUCF activities in the CDM, in order to "assist LDCs to achieve sustainable development goals."

There are two important reasons to maintain a limit on LULUCF activities in the CDM. The first relates to demand - the more credits on the market, the lower the price of the credit. CDM credits are already practically worthless, with CERs currently trading at 50 cents a ton. Opening the CDM to credits from carbon in soils and vegetation will flood the market, meaning prices drop even further, undermining any potential contribution to sustainable development.

The second reason is the lack of environmental integrity in land sector CDM activities. There are strict, environmentally determined limits on the maximum amount of carbon that can be restored to land carbon stocks, which is determined by the amount of carbon that was depleted from previous land use change (releasing carbon to the atmosphere).[9] Inclusion of additional land use activities does not increase the overall mitigation potential of the land sector, which is minimal compared to emissions from fossil fuel use. The primary mitigation potential in the land sector does not lie in its function as carbon sinks (sequestering carbon from the atmosphere), but in conserving the carbon stocks, and keeping these emissions out of the atmosphere. Activities such as reforesting, improved cropping or revegetation therefore, have lower mitigation potential than avoiding new emissions.

While LDCs may believe additional LULUCF activities will increase their access to the CDM, the reality is that carbon markets remain a poor way to transfer climate finance, with asymmetrical resource distribution and low carbon prices seen in the CDM likely to continue. Changes to the EU ETS Directive mean that from 2013, only CDM credits from LDCs are eligible in the EU ETS,[10] a revision that will have far greater impact on distribution than inclusion of additional land use activities.

One driver for inclusion of additional activities in the CDM could be the development of (internationally approved) methodologies for use in national emissions trading schemes. **Given the limited mitigation**

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[8] Members of the German Advisory Council on Global Change (WBGU) (2008) *Solving the climate dilemma: the budget approach. Special Report*. http://www.wbgu.de/fileadmin/templates/dateien/veroeffentlichungen/sondergutachten/sn2009/wbgu_sn2009_en.pdf

[9] Mackey et al (2013) Untangling the confusion around land carbon science and climate mitigation policy. *Nature Climate Change* **3** 552-557

[10] Directive 2009/29/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community Text with EEA relevance, article 11a. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:140:0063:01:EN:HTML

value of land-based carbon sequestration, expanding such methodologies should be viewed as unnecessary; any expansion of the land use sector in offset trading schemes should be rejected.

Addressing the risk of non-permanence under the CDM

The current approach for addressing the risk of non-permanence in LULUCF CDM projects is by issuing temporary credits (tCERs and lCERs), which have a limited lifespan and must be renewed, incurring additional transaction costs. Market demand for these credits has been limited, as they are not fully equivalent to ('fungible' with) credits from other types of CDM projects, resulting in very few forestry projects in the CDM. Many countries want changes to non-permanence rules in order to fully integrate the land sector into carbon markets; to improve the market function of LULUCF CDM credits and to generate fully fungible CERs.[11]

Several methodologies have been proposed as alternative options for accounting non-permanence of LULUCF projects. Nepal and Chile have proposed a buffer backed by host country or buyer country guarantee. This would mean that the host, or buyer, country commits to the reestablishment of forest if the buffer is too small to cover any unexpected loss. Australia also suggests a buffer, but emphasises that maintenance of such a buffer is the responsibility of the host Party. Australia suggests host Party responsibility for non-permanence could be used as an alternative to existing arrangements to improve the acceptance of CERs from LULUCF projects within international carbon markets and facilitate the issuance of fully fungible and permanent CERs.

Such an approach to non-permanence significantly increases the liability of host Parties. A buffer could decrease the income potential of land sector CERs in much the same way lCERs and tCERS currently does, while the proposal for host country responsibility for permanence may prove impossible to execute given the risk that a warming climate may change current carbon sinks into sources of CO_2.[12]

Non-permanence remains a barrier to fungibility between land use and energy credits. ***The idea that emissions reductions from these two sectors are fungible and can be offset against each other is scientifically flawed.***[13] The reality is that for all practical purposes, fossil fuel CO_2 emissions are irreversible, while land-based carbon sequestration is temporary.[14] It is generally believed that CO_2 has a life-span in the atmosphere of 100 years, yet only about 60% of CO_2 is removed from the atmosphere on this time-scale - as much as 20–35% of the CO_2 emitted will still be in the atmosphere after 2–20 millennia,[15] meaning that 'if carbon is to be usefully stored on land…, it must remain stored not just for 100 years, but for more than 10,000 years.'[16] ***The concept of 'permanence' as addressed in the CDM should recognise the long time-scales involved and the inability to offset fossil emissions with land carbon sequestration, rather than be weakened to facilitate trading of land-based credits.***

Additionality in LULUCF activities

Additionality is well defined in the context of the CDM and other carbon market initiatives. The concept of additionality in the CDM refers to actions that have been taken to reduce anthropogenic emissions of greenhouse gases in addition to those that would have occurred in the absence of the registered CDM project activity. This is generally measured against a business-as-usual baseline, although due to the counterfactual nature of proving what would have happened in the absence of intervention, a large

[11] See LULUCF submission from Australia (14 September 2012): http://unfccc.int/files/methods/lulucf/application/pdf/australia_-_submission_on_alternative_approaches_to_addressing_non-permanence_under_the_cdm.pdf

[12] Friedlingstein P et al (2010) Update on CO2 Emissions. *Nature Geoscience* **3**

[13] Carbon storage on land as a means to 'offset' CO2 emissions from burning fossil fuels (an idea with wide currency) is scientifically flawed. The capacity of terrestrial ecosystems to store carbon is finite and the current sequestration potential primarily reflects depletion due to past land use. Avoiding emissions from land carbon stocks and refilling depleted stocks reduces atmospheric CO2 concentration, but the maximum amount of this reduction is equivalent to only a small fraction of potential fossil fuel emissions. From Mackey et al (2013) Untangling the confusion around land carbon science and climate mitigation policy. *Nature Climate Change* **3** 552-557

[14] Ibid

[15] Archer, D. et al. Atmospheric lifetime of fossil fuel carbon dioxide. *Annu. Rev. Earth Planet. Sci.* 37, 117–34 (2009)

[16] Mackey et al (2013) Untangling the confusion around land carbon science and climate mitigation policy. *Nature Climate Change* **3** 552-557

proportion of CDM projects have been shown to be non-additional or additionality has been questioned.

Nepal on behalf of LDCs believes that the concept of additionality should apply to forest management activities. Their submission outlines that Annex 1 Parties need to clearly demonstrate in a verifiable manner that activities accounted for under forest management are in addition to a business-as-usual scenario, requesting guidance from SBSTA on how Annex I Parties would report on their achievement of additionality as required under Decision 2/CMP.7.

The EU, Russia and China all state in their submissions that there is no need for new modalities and procedures for applying additionality in Annex I Parties, nor under the CDM, for the second commitment period of the Kyoto Protocol. The EU considers the concept of additionality is adequate in LULUCF accounting rules, and has requested closure of the work programme, noting that any new concepts for accounting related to the land use sector in the context of the post-2020 agreement should be considered in the ADP discussions or incorporated into the work programme on a more comprehensive accounting framework for LULUCF.

The impossibility to prove additionality is a key limitation to environmental integrity, which should be adequately considered in conjunction with any discussions on additional activities in the CDM or changes to the rules around non-permanence.

Recommendations:

- **Discussions pertaining to the land sector in a post-2020 agreement are outside the mandate of this agenda item, and should wait until the appropriate framework to guide such discussions is established.**
- **Separate accounting frameworks for emissions from the land use sector and industrial emissions would maintain a distinction between fossil and terrestrial emissions, which would allow accounting in the land use sector to move towards a more comprehensive approach**.
- **Given the limited mitigation value of land-based carbon sequestration, and the danger posed by reversals, expanding such methodologies should be viewed as unnecessary and any expansion of the land use sector in offset trading schemes should be rejected.**
- **The concept of 'permanence' as addressed in the CDM should recognise the long time-scales involved and the inability to offset fossil emissions with land carbon sequestration.**
- **The current LULUCF rules on non-permanence should not be further weakened to facilitate trading of land-based credits.**
- **The impossibility to prove additionality is a key limitation to environmental integrity, which should be adequately considered in conjunction with any discussions on additional activities in the CDM or changes to the rules around non-permanence.**
- **Ultimately, the role of the land sector in carbon sequestration is limited, and reliance on land carbon sinks should be minimised in the context of ambitious climate mitigation.**