On AFOLU, 'wetland management' and the road to land-based accounting

Q&A

Questions and answers

WETLANDS INTERNATIONAL

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Photo cover: Hans Joosten.

Wetlands International & University of Greifswald
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Summary

Better management of terrestrial carbon stores (reservoirs) and fluxes (emissions and removals) can make a substantial contribution to reducing atmospheric greenhouse gas concentrations. This Question & Answer booklet aims to give insight into the opportunities and obstacles with regard to reporting and accounting for changes in carbon stores in, and anthropogenic greenhouse gas fluxes from, terrestrial ecosystems. Special attention is paid to *'wetland management'*, a proposed new accounting activity under LULUCF for which huge emissions reduction potentials are readily available.

It is concluded that the technical capacity, practical methodologies and user-friendly guidance for reporting and accounting for the most significant sources of emissions are already available or within reach before the start of the Kyoto Protocol's second commitment period in 2013. Elements of a roadmap towards mandatory, comprehensive, land-based accounting in the third commitment period are presented. Adoption of such a roadmap would provide strong incentives to address and resolve any outstanding methodological or capacity-building problems during the second commitment period (as we see for REDD+).

This Question and Answer booklet has been developed for the UN-FCCC negotiations on land use, land-use change and forestry (LULUCF) and was produced by Wetlands International and the University of Greifswald.

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Blanket Bog in the Flow Country, Scotland.
Photo: Norman Russell.

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AFOLU/LULUCF

1 AFOLU/LULUCF: what and why?

Any solution to climate change must include the better management of terrestrial carbon (carbon in terrestrial ecosystems) in agriculture, forestry and other land use sectors (AFOLU). This is recognised by the IPCC in Volume 4 of the 2006 IPCC Guidelines, which provides national guidance for annual greenhouse gas inventories across all types of managed land. These lands are divided into six land use categories: Forest Land, Cropland, Grassland, Wetlands, Settlements, and Other Land, and further sub-divided into land remaining in the same category and land converted from one category to another.

The UNFCCC commits Parties to conserve and enhance greenhouse gas sinks (sequestration) and reservoirs (stores) including biomass, forests and oceans as well as other terrestrial, coastal and marine ecosystems (UNFCCC Article 4.1(d)). In countries with mandatory national emissions reduction targets under the Kyoto Protocol, LULUCF (Land Use Land Use Change and Forestry) is the policy framework aimed at reducing emissions from the forestry and land use sector. For developing countries, REDD+ (Reducing Emissions from Deforestation and Forest Degradation) is the equivalent framework. REDD+ encourages developing countries to reduce emissions from terrestrial ecosystems in exchange for financial incentives and technical support from developed countries. Although REDD+ negotiations currently narrowly focus on Forestry, the framework could and should cover all AFOLU sectors.

2 What are the concerns around LULUCF?

Environmental groups and various Parties to the Kyoto Protocol worry about the environmental integrity of the existing LULUCF rules and fear that proposed changes could make matters worse. Particular concern centers around the treatment of *'forest management'* where some proposed accounting rules would undermine the integrity of national emissions reduction targets by allowing some emissions to be exempted from inclusion in national accounts.

A particular concern is that Parties only report and account for removals (sequestration) without symmetrically accounting for emissions, as, under current rules, reporting of almost all LULUCF activities is voluntary and Parties can choose to account or not to account for a particular activity.

Large emissions of GHGs from AFOLU sectors are ignored by use of such accounting rules. This is particularly worrying where Parties - by not choosing forest or cropland management - keep soil carbon emissions from biofuel production unaccounted for in LULUCF, but use the produced biomass as a *'climate-neutral'* substitute for fossil fuel in the energy sector. In this way the LULUCF rules stimulate the use of *'biofuels'* that result in more emissions to the atmosphere than using fossil fuels.

There are additional concerns about the feasibility and practicability of estimating and monitor

emissions and removals from LULUCF; about the high uncertainty levels of the estimates used in the IPCC guidelines; and about the lack of data with respect to land use and land use change. These concerns could undermine the credibility of AFOLU estimates and so make other sectors reluctant to accept full comparability with their reductions and removals. This concern is in particular expressed because mitigation activities in the LULUCF sector can be relatively cost-effective and, if full comparability is accepted, focusing on such activities could hold back industrial emission reduction opportunities.

Finally, there are concerns about how to deal with natural disturbances and catastrophic events, when greenhouse gases are released through not anthropogenic processes (e.g. a forest fire or disease) that are not the direct result of management activities, even if they are coming from *'managed lands'*.

3 Will LULUCF hold back reducing emissions from industrial sources?

Yes, to some extent, if it's more cost-effective.

Any additional way to reach a goal will - if implemented - reduce the necessary contribution of other ways. If your goal is difficult to reach, however, every opportunity to reduce emissions and increase removals deserves serious attention, including changing the management of terrestrial carbon stores. We no longer have the luxury of picking and choosing between policy alternatives. Given the urgency and scale of the problem, it is perverse to resist the introduction of any newer, cheaper, easier and faster strategies to reduce atmospheric carbon concentrations simply because they may disrupt established ones.

4 How permanent are LULUCF reductions?

Not automatically more or less than other reduction options. And actually the issue of permanence is of limited relevance.

The concern is that LULUCF achievements may not be permanent because reduced emissions or increased carbon stores may get lost again.

The permanence criterion is particularly relevant in the Kyoto Protocol's Clean Development Mechanism, where Annex 1 Parties with mandatory emissions reduction targets at home accomplish these targets by funding reductions in countries without such mandatory targets. It is also important for the voluntary carbon market where a similar one-side-open-ended situation exists.

Within and between Annex 1 countries, *'non-permanence'* as a result of anthropogenic activities is not a matter of concern. Within these countries, future losses of past gains have to be accounted for in the respective annual national budgets. This obligation provides a compelling incentive for Annex 1 states to be prudent and risk-adverse. With respect to Emissions Trading and Joint Implementation between Annex 1 countries, re-instated emissions are accounted for, where and when they are occurring. For all these situations of full accounting of emissions and removals, a permanence requirement unnecessarily restricts the flexibility of the LULUCF mitigation mechanism by preventing an Annex 1 party from simply making up losses in one area by gains in another.

A special issue is the loss of achieved reductions as a result of natural factors (fire, drought, pests, disease, etc.). This issue is, however, not limited to LULUCF and has to be dealt with in the general discussion on *'natural disturbances'* and *'catastrophic events'*.

5 Must LULUCF reductions be additional?

No.

Additionality means that the beneficial effects for the climate would not have happened without activities deliberately implemented for the goal of climate change mitigation. Developments that are happening *'spontaneously'* or because they bring other benefits that make the activity anyhow economically attractive, are not additional.

For reaching global climate goals, it is irrelevant how emissions reductions are achieved - any reductions should be equally welcome: an economic crisis, for instance, *'cools'* the climate in exactly the same way as an expensive, targeted renewable energy investment. All developments that are good for the climate, including incidental ones that happen without additional costs, should be welcomed as a blessing for the climate.

However, non-additional (*'spontaneous'*) emissions reductions must have an effect on:

- the price of carbon credits. The low or zero costs of *'hot air'* credits (credits that arise without deliberate action) may slow down emissions reduction efforts in other sectors. This is not a problem, however, because the overall reduced emissions also reduce the absolute climate burden from these sectors.
- the reduction ambition. Countries and sectors with better cost-effective reduction potentials can - with the same effort - add more to the overall reduction commitment than countries or sectors without such opportunities.

6 Is use of the 1990 reference year still adequate?

The answer on this question is *'yes'*, *'no'*, and *'not necessarily'*.

The reason for this Delphic answer is that, within UNFCCC discussions, *'1990'* is being referred to (but generally without being recognized as such) for three totally different purposes:

I) as a reference point for a goal: an agreed standard against which to express the goal and to measure achievements,
II) as a reference level of effort: a standard against which to measure and express efforts, and
III) as a safeguard against perverse speculation.

Purpose I: As a reference point for a goal:

To communicate unambiguously, you must formulate goals in clear units against a stable standard. The expression *'still 3'* is meaningless unless you add *'hours of flight'* and *'to Tianjin'*, or *'months until Christmas'*. Conversation is predictably confusing when one participant talks about the first and the other thinks about the latter.

Emissions reduction pledges that only mention numbers (*'megatonnes'*) but not the standard (*'compared to year **xxx**'*) give insufficient information and can give false impressions. Percentages without reference to a standard are even more misleading as a change in standard in such case also changes the content of the units: 20% compared to 1990 is a different number of megatonnes than 20% compared to 2010. For effective, honest communication, figures must be expressed against a clear, agreed and stable standard. This should not be a political problem, because the choice of unit and standard does not change the effort to reach a goal: expressing temperature in Celsius, Fahrenheit or Kelvin does not affect the number of blankets needed to feel warm and comfortable.
As a reference point for a goal, *'1990'* (or whatever period in the past for which there is good enough data) is still an adequate standard. As clear and stable standards are easily convertible between each other (*cf.* currency exchange), the quest for other standards is legitimate but must always be subject to critical oversight to prevent self-serving perversities being suggested.

Regretfully, the UNFCCC has already allowed the Kyoto Protocol to apply double standards that undermine the integrity of national accounting systems. For instance, gross-net accounting as it is applied to afforestation, reforestation and deforestation as well as to forest management, does not use the same standard and produces less reliable estimates than can be expected from using net-net accounting. Despite the different standard used and the resulting different units, the resulting credits are called the same and counted as equal. It might look as if you are approaching your goal, but in fact you may not be, or not as fast as you claim. Forward looking approaches (using forecasts of future emissions as reference points) are even less acceptable as a reference point for a goal, because they are neither clear (unverifiable assumptions) nor stable (subject to unpredictable changes).

Purpose II: as a reference level for effort:

A clear and stable standard (e.g. a 1990 base year) is necessary to measure how far you are still away from the goal (when the goal is also defined against that standard). Such a standard, however, does not say anything about the efforts taken or needed to reach that goal. An emissions reduction target of, say, 30% compared to 1990 inevitably requires much more effort from some countries compared to others. Whereas forward looking standards (baselines) are unsuitable as a reference level to express a goal, they are extremely useful to estimate the endeavours (compared to business as usual) necessary to reach that goal, i.e. to assess additionality. As Q&A 6 argues, such reference is useful to facilitate the fair formulation of equal commitment in cases of differentiated capabilities.

Purpose III: as a safeguard against perverse speculation:

When discussing new accounting rules and procedures, there is always a risk that proponent Parties anticipate the implications of the adoption of particular rules for their own benefit. When re-forestation was first discussed in the 1990s as an activity in LULUCF accounts, the loophole of countries cutting their forest unaccountedly while claiming subsequent reforestation as a climate mitigation activity, had to be closed. The solution was to allow accounting for reforestation only on land that had been deforested before 1990. As such safeguard against perverse speculation on future developments, the year 1990 loses its value with the passing of time. For *'wetland management*', for instance, you could just as well take 2008 because, before 2008, nobody could have seriously anticipated that peatland rewetting might become a serious and accountable mitigation activity. That is to say, it is safe to assume that nobody has drained peatland before 2008 with the sole purpose of rewetting them afterwards and gaining the accounting benefits from doing so.

7 Will a cap on LULUCF fix the loopholes?

No.

Settling for a cap is an indicator of mediocrity. Either a mitigation activity is effective and should not be restricted or it is fraudulent and should not be allowed at all. Capping does not prevent fraud; it merely limits its effects. This is not good policy. The only significant existing loopholes in LULUCF relate to *'forest management'* where the use of gross-net accounting and adoption of forward looking baselines may allow creation of credits that have less value than those derived from other activities but are accounted for and traded as equivalent.

Far better and more honest than capping is adopting uniform, clear and stable standards for all AFOLU activities (see Q&A 6). Better than capping is also adopting mandatory accounting for activities first and then, based on honest and transparent accounting rules, choose the *'numbers'* (the level of emissions reduction commitments that parties are prepared to make) later. In such a

way, you can effectively use the greater opportunities that accounting for more AFOLU activities provide. In the current negotiating situation both the goals and the commitments and the accounting rules are still the subject of ongoing discussions. If Parties are serious about urgently mitigating climate change, they should:

- clearly formulate the shared emissions reduction goal
- use all mitigation opportunities available
- distribute the responsibilities between all countries in a just and fair way, and
- develop realistic emissions reduction pathways for parties to contribute to reaching this goal.

Greenhouse gas measurements with chambers in Belarus.
Photo: Hans Joosten.

Q&A

Wetland management

8 What is 'wetland management'?

According to current proposals, *'wetland management'* is *'a system of practices for rewetting and draining on land that covers a minimum area of 1 ha. It includes all lands that have been drained and/or rewetted since 1990 and that are not accounted for under any other activity, where drainage is the artificial lowering of the soil water table and rewetting is the partial or total reversal of drainage'*.

'Wetland management" is thus an activity under LULUCF that, like other activities such as *'grazing land management*' or *'revegetation'*, may apply to various existing IPCC land use categories. Thus the activity *'wetland management'* is, following the activity based philosophy of the Kyoto Protocol, not limited to the category *'Wetlands'* (mind the extra 's' in the category name). *'Wetland management'* deals with a change in hydrological management of land and its consequences and applies to all land that has been drained and/or rewetted since 1990, unless fluxes from that land are already being accounted for under another elected Article 3.4 land use activity.

'Wetland management' may thus be applicable to forest land, cropland, grassland, wetlands, and settlements, and equally to peat soils and mineral soils. It will, however, be especially relevant to managed (=drained) peatlands. In peatlands, a change in water level can be expected to lead to far greater changes in greenhouse gas fluxes than in other situations.

Currently accounting for *'rewetting'* (e.g. under cropland- or grazing land management) implies that all emissions relevant to all activities on all land belonging to the associated category (e.g. cropland, grassland) must be accounted for. In a country like Germany, for instance, this would involve fully accounting for fluxes associated with not only the 600 km^2 of rewetted grassland on peat soil and the remaining 6,000 km^2 grassland on drained peatland, but also for the 60,000 km^2 of grassland on mineral soil. The associated auditing workload and limited reduction potential of the much larger latter area understandably discourages countries from voluntarily electing to account for activities like cropland and grazing land management.

'Wetland management' does not treat *'rewetting'* as a practice under the existing activities forest-, crop-, or grazing land management. In contrast *'rewetting'* becomes a practice under a new activity *'wetland management'* applicable to the categories forestland, cropland or grazing land when the associated activities (forest management, cropland management or grazing land management) are NOT elected.

9 Why is accounting for emissions from drained land necessary?

Emissions from drained land are disproportionally large. Drained peatlands, covering a mere 0.3% of the global land surface, are responsible for some 6% of total global anthropogenic CO_2 emissions. Worldwide, CO_2 emissions from drained peatlands have increased by 25% since 1990. Peatlands are currently being subjected to renewed and deeper drainage for biomass cultivation, perversely leading to larger CO_2 and N_2O emissions. This means that land use, with increasing yet unaccounted for emissions, is directly linked to the energy sector where biofuels are used for claiming emissions reduction by substituting for fossil fuels regardless of the emissions associated with their production. This perverse development can only be eliminated by accounting for carbon losses and GHG emissions from land use - land-based accounting.

As long as full land based accounting or mandatory accounting of all Art. 3.4 activities is not implemented, key *'wetland management'* practices (incl. rewetting drained peatlands) could achieve substantial emissions reductions from such *'hotspots'* with high levels of ongoing emissions.

10 Is 'wetland management' 'cherry-picking'?

Yes it is.

If you have a problem, you must try to solve it in the most cost-effective way. If you want to cool the climate as a matter of urgency and money is limited, you first take the measures that might bring the most benefit with the lowest effort and if that is not sufficient you address next-best alternatives. That's why the Kyoto Protocol Parties first addressed the cherries of industry and only after that the other more expensive options. That's why accounting for afforestation/reforestation and deforestation is mandatory while other LULUCF activities are voluntary. That is why more countries have chosen *'forest management'* and fewer account for *'cropland-'* or *'grazing land management'*.

Even if all AFOLU activities were mandatory, countries would still concentrate on activities with the overall best mitigation effect. When you can *'cherry pick'* between *'good'*, *'better'* and *'best'*, it is smart to pick the best. Drained peatlands are responsible for a significant amount of the emissions from land use (in aggregate, >25%, IPCC 4th assessment report), and rewetting is relatively cost-effective. Therefore 'wetland management' is always likely to be among the best cherries in the cake of LULUCF climate mitigation opportunities.

Conversely, it is bad for climate change mitigation efforts when 'cherry picking' becomes perverse selection, i.e. that only positive practises are selected while associated negative ones neglected. The option of perverse selection is effectively blocked in the fully symmetrical 'wetland management'

proposal, where both rewetting and drainage are addressed and associated changes in negative emissions and positive sequestration fluxes are fully accounted for.

11 Is methane a problem?

In some cases, but generally not.

As well as sequestering net CO_2, peatlands may also emit methane (CH_4) and nitrous oxide (N_2O). In the case of peatland drainage, CH_4 emissions from peat soils decrease whereas CO_2 (and N_2O) emissions increase. In case of peatland rewetting, the opposite occurs: CO_2 and N_2O emissions strongly decrease while CH_4 emissions increase.

The scientific data base for methane (CH_4) emissions from peatland is much larger than that for CO_2 or N_2O and several high quality reviews on the subject have recently been published (Couwenberg et al. 2010, Couwenberg 2009, Lay 2009, Saarnio et al. 2009). We now have a good understanding of the major mechanisms behind CH_4 formation in, and emission from, peatland.

The increase in methane generation upon rewetting is (expressed in Global Warming Potential) generally of much less importance than the decrease of CO_2 and N_2O such that substantial atmospheric benefits can be confidently expected. Only when luscious crops or grasses are flooded, the climatic effects of increased CH_4 emissions may, in the short term only, be larger than those of CO_2 and N_2O emissions reduction. In the mid- and long-term, however, rewetting of peatlands always leads to a net reduction of climate relevant emissions.

Methane emissions strongly depend on water level. Methane emissions occur only at mean annual water levels above -20 cm, a general rule that applies to boreal, temperate and tropical peatlands and to bogs and fens alike. Water levels above the peat surface often again result in lower methane emissions. For tropical peatlands the fluxes are low compared to those from temperate and boreal zones. Emissions from rice paddies on tropical peat are high, but fall within the IPCC (2006) default range.

12 Can we monitor emissions from peatlands adequately?

Yes we can.

Peatlands do have some particularities that make monitoring challenging, including their mix of greenhouse gases and the fact that carbon stock changes cannot easily be used as a proxy for greenhouse gas fluxes.

This challenge however, is not only an issue for the new activity *'wetland management',* but also for all LULUCF activities accounted for under Art. 3.3. and Art. 3.4. Afforestation/reforestation and deforestation, forest-, cropland- and grazing land management, and revegetation also have to cope with this challenge where these activities take place on organic soil. The peculiarities of peatlands are thus no reason to exclude *'wetland management'* from the Kyoto Protocol; they are already in! It is also worth remembering that such estimation challenges exist for all activities in all sectors, including industrial emissions.

IPCC default values for Art. 3.3. and Art. 3.4. activities on drained peat soils exist, but need to be revised in the light of rapidly accumulating new research data. Concrete proposals to update default values have already been presented. Extra attention also needs to be paid to methane emissions that may occur upon rewetting (see Q&A 11) but, even for this parameter, sufficient data is being collected and methodologies developed to support adequate monitoring and accounting in the near future.

In fact, detailed methodologies for monitoring all major emissions from peat soils in all significant situations are rapidly developing. Direct GHG measurements techniques, such as eddy co-variance and intermittent and continuous chamber measurement are well established, but generally too expensive for widespread application for monitoring purposes. As net emissions of CO_2, CH_4 and N_2O from peatlands are all strongly correlated with mean water level and vegetation type, the latter two parameters can successfully be applied as proxies (like proxies are also standardly being used in other sectors). Several German federal states, for example, have already presented detailed, comprehensive assessments of the actual GHG fluxes from their entire peatland area.

13 How can existing monitoring gaps be closed?

Several assumed gaps thus in fact do not exist and existing ones are no unique feature of *'wetland management'*.

To monitor adequately for *'wetland management'*, you need data on the extent and location of drained lands, organic soils and the relevant emission factors. The first data are easily available in Annex 1 countries. The existing IPCC guidance (that can very easily be updated and improved) provides default values for a very cost-effective tier 1 reporting. More accurate inventory, monitoring and reporting can be concentrated on the organic (~ peatland) soils, where emission reduction is most lucrative.

14 How to deal with uncertainties?

Under the current UNFCCC reporting system, *'estimates of emissions should be accurate in the sense that they are systematically neither over nor under the true value, so far as can be judged, and that uncertainties are reduced so far as is practicable'* (UNFCCC 2003).

Whereas the capacity for monitoring greenhouse gas fluxes from peatlands is rapidly increasing, in some countries and situations (CH_4 emissions from recent rewetting, N_2O emissions from drained fen peatlands) the overall estimates may not yet be very accurate. In such cases *'the principle of conservativeness'* has to be applied and reductions should be estimated at the low side of the range. This means that the lowest reasonable emissions have to be used in the baseline accounting and the highest reasonable emissions in the commitment period.

The conservativeness principle is already applied in the Kyoto Protocol, e.g. in 16/CMP.1 (annex par. 21) and as a *'punitive'* instrument applied by reviewers in the adjustment procedure of the KP reporting. The conservativeness principle contributes to the climatic integrity of LULUCF and provides a win-win option. It guarantees that *'wetland management'* does not lead to *'fake'* emission reductions (in fact you will always create more reduction than you account for). On the other hand, the approach will stimulate countries to increase the quality of reporting and develop methodologies for assessing emissions and removals more accurately.

Uncertainty is thus no good reason for treating *'wetland management'* different from other activities. Difficulties with data availability and certainty have never led to exempt gases and sectors. In agriculture, for example, N_2O which is responsible for 6% of total GHG emissions in the EU-27 is accounted even with an uncertainty of around 100% (personal communication by Giacomo Grassi (JRC)).

15 Is there sufficient guidance to account for 'wetland management'?

Not yet, but sufficient data and insight are available and being gathered to have this guidance before the start of the second commitment period.

16 For which countries is 'wetland management' lucrative, for which a risk?

'Wetland management' will be lucrative for all Annex I countries with substantial areas of drained peatlands that are abandoned and/or can easily be rewetted and used for wet agriculture and forestry (*'paludiculture'*), nature conservation, or improved water management.

There is no substantial risk for Annex I countries to adopt *'wetland management'*. Annex I countries have hardly drained new areas since 1990. As peatlands decrease in area when drained (because peat oxidates and disappears), the drained peatland area has since 1990 in fact decreased in almost all Annex 1 countries. The latter also implies that the drained area in e.g. 2010 can - in absence of other data - be used as reliable and conservative proxy for the area of drained peatland in 1990.

Potato field on drained peatland in Ukraine.
Photo: Hans Joosten.

Q&A

Towards land-based accounting

17 What is land-based accounting?

Land-based accounting is the full accounting of all emissions and removals (including carbon stock changes) on all managed land in a country. Land-based accounting treats LULUCF in the same way as other sectors in Annex A to the Kyoto Protocol are treated. All emissions and removals are accounted as reported in Parties national greenhouse gas inventories. Land-based accounting provides a complete picture of what is really happening in the landscape across the entire land use sector, rather than - as in the current LULUCF practice - singling out particular activities.

18 Why is land-based accounting necessary?

Currently countries can choose which land use activities under article 3.4 of the Kyoto Protocol they want to account for. Not choosing an activity means that the emissions from this activity remain *'hidden'* and can increase without being accounting for. This is in particular a large risk with expected intensification of land use for the production of biofuels. Land-based accounting precludes perverse selection and closes loopholes from (unaccounted) displacement of emissions between sectors and land categories.

Not accounting for all land use activities also means that there is no incentive to reduce emissions and increase removals from them, which means missing interesting, feasible and often *'low hang fruit'* mitigation opportunities, that can help Annex I countries to achieve more ambitious emissions reductions targets.

Furthermore, land-based accounting:

- best reflects the actual exchanges of greenhouse gases between the atmosphere and biosphere
- provides long-term incentives to protect existing carbon reservoirs, increase carbon removals, and reduce greenhouse gas emissions through better land management
- provides incentives to develop new land management practices and technologies
- minimises leakage and double counting
- is easier to monitor and verify than activity-based accounting
- has many co-benefits including improving air, soil and water quality, biodiversity, and food security.

19 What opportunities are missed without more comprehensive accounting?

The mitigation potential of the land use sector is very significant; about 30% of the emissions are caused by the land use sector. In addition, reducing emissions from LULUCF is very feasible, since the largest share of emissions takes place on concentrated areas of land.

In the EU, for example, emissions from cropland management amount to 70 Megatonnes CO_2/yr. Only 12% of the cropland area is responsible for over 95% of the emissions:

- 2% of the cropland area (the category *'cropland remaining cropland'*, organic soil) is responsible for 43% of the cropland emissions
- 10% of the cropland area (the category *'land converted to cropland'* (excluding FL to CL) is responsible for 52% of cropland emissions
- 88% of the cropland area (the category *'cropland remaining cropland'*, mineral soils) is responsible for only 5% of the cropland emissions (personal communication by Giacomo Grassi (JRC)).

20 What are the concerns about land-based accounting?

There is a general concern that the consequences of land-based accounting are not foreseeable. Indeed, data are needed before conclusions can be drawn and therefore countries need to monitor their carbon reservoirs (pools) and GHG fluxes with reliable methods. Various countries argue that they are not yet able to manage the necessary inventory and monitoring. A concern linked to this is that while such methods exist, they tend to be expensive.

Since 2005 Annex I Parties already submit a complete time series (since 1990) of emission and removal data to the UNFCCC, following IPCC land categories. This means that a land-based accounting not necessarily implies an additional burden on the reporting system, although reporting data from the first commitment period are overall inadequate. However, lack of high-quality data (see Q&A 2 and 12) is no excuse to limit the accounting regime. Getting the data right is not a question of lacking technologies and methodologies, but most and for all a matter of political will to improve capacity for better monitoring and reporting and to allocate adequate budget.

21 How to come to land-based accounting?

The concerns about lack of MRV-ability (see Q&A 20) can be addressed by a clear and strong roadmap towards adoption of mandatory comprehensive land-based accounting for the third commitment period. Capacity, methodologies and guidance for reporting and accounting for

the most significant pools of emissions are already available or within reach before the start of the second commitment period. Strong incentives towards comprehensive accounting will further investments to address any outstanding methodologies or capacity. The rapid progress in Measuring, Reporting REDD+ shows that developed countries should also be able to apply these capacities for AFOLU in their own countries. If only a small portion of the funds spent on REDD+-readiness activities were spent at home on exactly the same information systems, MRV and governance improvements, most if not all barriers to introduce land-based accounting for Annex 1 countries would soon be overcome.

The roadmap towards land-based accounting has already started with the SBSTA decision to improve reporting guidelines on annual inventories (FCCC/SBSTA/2010/L.12), including the clarification of methodological issues related to harvested wood products, wetlands and nitrous oxide emissions from soils and more guidance on Tier 3 approaches.

The following steps are proposed for the second commitment period to come to mandatory land-based accounting in the third and subsequent commitment periods:

- Make all existing 3.4 activities mandatory.
- Add *'wetland management'* as an accounting activity (at least voluntary).
- Collect better data, with requirements for spatially explicit Tier 3 reporting.
- Concentrate MRV efforts on hotspots, i.e. areas of land with most significant emissions, and estimate these emissions in the most accurate possible way given the available resources. The most significant sources should be estimated with Tier 2 or 3 methods. Tier 1 is sufficient (and already available) for the remaining area of land activities. In this way comprehensive data availability is not necessary since accounting for an activity does not mean estimating everything, everywhere with tier 2/3 methods. Also concerns on accuracy of data are addressed (even more than in some other sectors) by taking a *'hotspots'* approach. This approach is feasible because most emissions take place on concentrated areas of land and as a result of a limited subset of activities (personal communication by Giacomo Grassi (JRC)).
- Review the proposed SBSTA work programme to support and facilitate countries in meeting these more onerous reporting requirements.
- Establish a work programme for joint effort (joint implementation) to support countries that lack capacity. The fact that some countries have more problems than others must not be an obstacle for making the LULUCF sector more effective in reducing emissions.
- Reduce compliance risk by including a provision to deal with natural disturbances and catastrophic events, with incentives for activities that accelerate recovery.
- Apply the conservativeness principle: as long as sufficient accuracy is not achieved, reduction estimates should be at the low side, by assuming low-side-of-the-range emissions in the baseline and high-side-of-the-range emissions in the commitment period. The conservativeness principle is already applied in the Kyoto Protocol (cf. paragraph 21 of the annex to 16/CMP.1).

Mission:

To sustain and restore wetlands, their resources and biodiversity for future generations.

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