

## WHERE TO WITH LULUCF? FIRST, HOW DID WE GET TO HERE?

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It is common in writings about ‘sinks’ and the Kyoto Protocol to find references about how difficult or contentious it’s all been. Few would argue that negotiators “got it right” on sinks in Kyoto – or that the current framework for the Protocol’s first commitment period should automatically be the starting point for a “post-2012” international climate change regime. Indeed, most of the thinking on this matter that is just beginning to emerge seems prepared to consider very different ideas.

But, for all its flaws, the framework that emerged in Kyoto had a logic. It was the best that could be done at that time based on the level of countries’ understanding of the underlying issues and available data. It is important now to understand what these issues and logic was. This is not to suggest that a future framework for LULUCF may not be very different. However it will need to address the same fundamental issues.

That a very different framework may emerge is made possible by the fact that in the ensuing years countries’ awareness has had the benefit of substantial, albeit often very ‘hard slogging’, debate on ‘sinks’ issues. Importantly, there has also been the work of the IPCC – both the *Special Report* and *Good Practice Guidance*. Countries now are so much better informed than in 1996-97 during the AGBM negotiations that led to Kyoto.

This said, most of the difficult ‘atmospherics’ that has typified so much of the debate has been around matters that might be seen as “output issues” of the framework decided at Kyoto – things such as definitions of words like afforestation and reforestation, capping Article 3.4 sinks and “factoring out”. Others, like the many issues that have been confronted regarding ‘sinks in the CDM’, are also a result of the broader Kyoto framework, than just around LULUCF per se.

The purpose of this article is to take a step back and discuss some of the underlying “input issues” that resulted in the current framework. If different ways are found to address these in a new framework, the output issues that have so tested negotiators in the last five years may no longer be as relevant or important. It seems better to think about this first than to just continue slogging along on the old problems, or discard sinks altogether because of the difficulties.

In fact these fundamental “input issues” are not that complex. The difficulties arise in how they were addressed. This should be encouraging to the present (and next) generation of negotiators and senior decision-makers who so often comment that LULUCF issues seem to be so impenetrable.

Perhaps not surprisingly, most of the issues are rooted in what was perceived as representing equitable<sup>1</sup> treatment.

**Issue 1: In an accounting system for countries taking on binding commitments in an international climate change regime, should removals of CO<sub>2</sub> from the atmosphere by sinks be considered as a ‘credit’ against the ‘debit’ of an emission of CO<sub>2</sub> to the atmosphere?**

Simple logic suggests “Yes”. Imagine two countries with identical emissions profiles but where one is managing and enhancing a large forest estate with substantial annual CO<sub>2</sub> removals and the other has no forests. Why should the country with the CO<sub>2</sub> removals not be appropriately rewarded, hence treated differently than the country without? Importantly, in the absence of any such recognition, what incentive exists to “enhance removals by sinks”<sup>2</sup>, in either country?

Moreover, when considering a larger set of countries and recognising the significance of emissions of CO<sub>2</sub> to the atmosphere from the LULUCF sector, if you want these emissions to be included in the accounting system how could you not take a balanced approach and include removals? And if you leave out LULUCF emissions, what incentive exists to “protect reservoirs”?

This simple logic formed the basis of the positions of the ‘pro sinks’ countries in the Kyoto negotiations. Those who opposed sinks didn’t oppose this logic per se. They primarily questioned the ability to devise a practical means to include the accounting of sinks in an equitable manner that adequately maintained the environmental integrity of the overall agreement. Two particular concerns were the higher uncertainties around LUCF data and the potential non-permanence of removals by sinks.

**Issue 2: The fundamental ‘logic problem’ of applying a “net-net” approach to including forest sinks**

Early on in the AGBM negotiations a number of pro-sinks countries proposed a net approach. Countries would be judged in the future (e.g. in 2010) on how their net emissions including the LUCF sector compared with a target based around their net emissions in the base year (e.g. 1990). But, as countries began to analyse their positions based on better data including projections for a period some 20 years from the base year, a fundamental problem with this approach became apparent.

Put simply the problem is that forests do not grow uniformly or forever in terms of their sequestration of carbon. A typical growth curve for a forest is “s shaped”. Following a slow growth phase as trees establish themselves, it then begins a phase of high carbon uptake which in time slows again eventually to zero (i.e. a forest that is a reservoir but not a sink).

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<sup>1</sup> The nature of the Kyoto negotiations was such that equitable treatment loomed large in countries’ positions. Importantly, how equity is treated across the board in the next round of negotiations may mean different approaches are taken in particular issue areas because overall priorities are different, or are managed differently.

<sup>2</sup> Under Article 4.1(d) of the UNFCCC all Parties shall “promote and cooperate in the conservation and enhancement, as appropriate, of sinks and reservoirs”. And Article 4.2(a) specifically commits Annex I Parties regarding “protecting and enhancing sinks and reservoirs”.

Another example of a forest with zero removals is a sustained yield production forest where carbon uptake by ‘younger’ age class stands is balanced by carbon removed through harvesting.

The extent of the problem of the net approach depends on the distribution in the base year and future period of trees in various stages of carbon sequestration rate, i.e. the “age class distribution” of trees in the forest. This problem can become especially acute for temperate or tropical region countries where tree growth is rapid.

The following simple example illustrates the problem by comparing two countries. In this example “gross emissions” are from sources not including the LUCF sector.

Country	Year	Gross Emissions	LUCF emissions	LUCF removals	Net emissions
A	1990	100	25	50	75
	2010	95	25	25	95
B	1990	100	0	25	75
	2010	120	0	25	95

This example shows how, for country A, a reduction in removals from the LUCF sector due to a change in age class of the growing forest can mean a huge increase in net emissions even though gross emissions decreased. The mathematical logic ‘flaw’ of the net approach is that you cannot tell a situation where you have done less of a ‘positive’ thing for the atmosphere, i.e. less removals (country A), from where you’ve done more of a ‘negative’ thing, i.e. more emissions (country B).

If in the run-up to the crucial negotiations in Kyoto the relevant data had been well understood and transparent and if the concept of differentiation had been well accepted, this problem could potentially have been got around by a commensurate adjustment of the targets for particularly affected countries. But neither of these “if” circumstances were the case that existed at the time.

Instead an alternative idea for solving the problem, the “gross-net” approach emerged. In this approach the target would be based on just gross emissions in the base year and credit would be given for removals by net emissions accounting in the future commitment year.

**Issue 3: The “emissions loophole” problem of the “gross-net” approach – and how its solution raised other problems that then needed solutions**

Upon analysis of countries’ data including projections, a problem with the gross-net approach then became apparent. This is best illustrated by considering country B in the example above. Let’s say that country B took a 5% reduction target for 2010 based on its gross emissions in 1990, i.e. its target is 95. It can be seen that under a gross-net accounting approach, because of its removals in 2010, country B achieves this even though it has increased its emissions by 20%.

This outcome became referred to as an “emissions loophole”. In real terms the potential scale of this loophole was very large. The majority of Annex I countries’ forests are in more northern

slow growing regions. The removals in 2010 could therefore be expected to not change much over 20 years (i.e. more the country B profile). Data available at the time of Kyoto indicated that in 1990 net removals from the LUCF sector for Annex I countries were about 10% of gross emissions. A loophole of this size would have overwhelmed the expected outcome of the Kyoto negotiations which, for the 2008-2012 period, was a reduction of emissions to the atmosphere from Annex I countries of about 5% from 1990 levels.

The ‘solution’ found for the gross-net loophole problem was to introduce the “since 1990” partial accounting concept embedded in Article 3.3. This removed consideration in the accounting system of those forests that existed in 1990. Credits would only be given for removals in the commitment period by “since 1990” forests. Other solutions proposed (such as an overall downwards adjustment of all targets by about 10%) did not gain the necessary traction during the rather chaotic and fractious sinks negotiations.

The “since 1990” approach, which has been one of the key problematic areas as Annex I countries have had to implement domestic Kyoto sinks policies (because of the many ‘boundary issues’ it raises), does however have this logical basis which was important for the expected environmental outcomes for the first Kyoto period.

This said, countries subsequently chose for political reasons to allow a portion of the loophole back into the accounting framework when at COP6.5 and COP7 they allowed capped (but not inconsiderable) amounts of credits for “forest management” under Article 3.4.

A consequent problem of the “since 1990” framework of Article 3.3 is that it created a difficulty for northern, slow forest growth countries that also have a degree of deforestation (e.g. for urban or recreation area expansion). Even though these countries could be a net sink in full LUCF terms they could lose assigned amount. This anomaly required a special negotiated ‘fix’ in the Marrakech Accord sinks text. Another ‘fix’ associated with the partial accounting framework was needed for fast forest growth countries that may already be harvesting “since 1990” forests in the Kyoto first period. This ensured that the debit for harvesting any trees was only equal to what credits had previously been received for their carbon uptake from 1 January 2008<sup>3</sup>.

#### **Issue 4: Is reducing emissions from LUCF as creditworthy as increasing removals?**

A debate has gone on for some time on this question, albeit mostly an academic one so far. This debate to some degree hinges on interpretations of the commitment in the UNFCCC “to protect and enhance sinks and reservoirs” as compared with commitments to reduce (gross) emissions.

This issue however did come up in the pre-Kyoto discussions that dislodged the net-net approach. Given the language in the Convention, it was argued that it clearly was not the intent to grandparent a base year’s rate of deforestation into the future. And if this was true, then equally it should not have been the intent to grandparent the obligation of sequestration removals by forests (especially given the biophysical ‘s-shaped’ forest growth reality).

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<sup>3</sup> Provided that there was no land use change (i.e. not deforestation)

But, even on the grandparenting deforestation point, a political solution (the second sentence of Article 3.7) was agreed to deal with the ‘special case’ of Australia, the only Annex I country with significant and reducing land clearance emissions.

### **Issue 5: What about the extra “LU” in LULUCF?**

Prior to Kyoto the focus of sinks was on the land use change and forestry (LUCF) sector. This aligned with the reporting on this sector under IPCC inventory guidelines. Primarily this covered removals of CO<sub>2</sub> by forest sinks and emissions from forests including through land use change, i.e. deforestation.

The discussion subsequently broadened to consider emissions and removals of CO<sub>2</sub> from land use itself. In particular, this picked up the opportunities to sequester significant amounts of carbon in agricultural soils through changed tillage practices.

The eventual agreement in the Marrakech Accord to include this activity under Article 3.4 adopted a “net-net” approach. While the concern of the net-net approach discussed above in Issue 2 may well exist in theory for sequestering carbon in agricultural soils, in practice this did not prove to be a concern of relevant Parties for the Kyoto first period.

### **So, where to from here?**

It is important to note that key provisions pertaining to sinks in the Marrakech Accord are explicitly just for the first commitment period. This opens the door for more practical and implementable solutions to be negotiated next time around.

However, the fundamental issues raised above do not go away. Importantly, it should be seen that the way that these were treated in the Kyoto agreement for the first period has had a huge influence on the ongoing implementation rules and guidelines. This is true both for the ensuing international process (which has been slow going) and also for domestic implementation of LULUCF policies.

Any alternative ways of addressing these issues is likely to have a similar profound effect on ongoing international and domestic policy processes. This is an important consideration in seeking a simpler way forward on LULUCF that can remove barriers to more engagement by developing countries.

Moreover, it is not just implementation practicalities that are involved here. Some of the big picture policy questions (or “output issues” as they are described above) still being grappled with, e.g. “factoring out”, may look quite different under an alternative framework that successfully deals with these fundamental issues.

Given the difficult history of sinks negotiations, a valid concern may be that only incremental changes to the hard-negotiated framework should now be considered. But there are reasons for there being confidence that a much better framework might emerge from having a fresher look. Importantly, as noted above, the knowledge base is vastly improved from that which existed in

1996-97. Also countries now have practical experience about what is necessary to implement policies domestically and hence are likely motivated to find more practicable solutions.

Moreover, a future more inclusive international climate change regime will need to account for the fact that developing countries' LULUCF emissions and removals profiles are generally very different than for major Annex I countries.

The obvious question becomes what type of framework best provides the incentives to encourage the desired outcomes, and which can be seen as equitable taking into account the overall regime package, while minimising the potential for unintended consequences that work against these outcomes.

From a practical perspective, such a framework will need to take into account the implied requisite needs to implement it, in particular around monitoring and reporting. On the one hand simplicity is needed to avoid creating barriers to engagement by more countries; on the other hand, where market incentives are being created, there will be a minimum set of data quality requirements to ensure credibility and the integrity of the market commodity.