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LULUCF (AFOLU?) Dialogue

Madrid

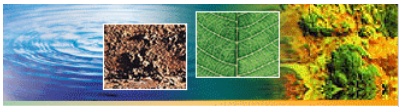
Inventory should be as simple as possible – but not more so

The Questions….

- There are many separate concepts embedded:
  1. Is comprehensive treatment (lands, gases and activities) more simple?
  2. Is a patchwork of lands/activities more difficult?
  3. Should we monitor lands or activities (or land systems)?
  4. Anthropogenic, human induced, indirect and natural
  - *temporal scale* is not questioned – yet this is a critical and related consideration
  - Are we monitoring lands and/or activities, and can they really be separated?
  - Need to look at the synergy between the policy and the technical practice – what technical approach is needed to meet policy aspiration?
  - Have the simplifying assumptions (eg C stock change =CO_2) now become a source of complexity?

What is comprehensive?

- All lands/land uses (or managed only)?
- All carbon pools and forms of gases (human and natural)?
- All activities (or selective)?
  - 2006 GLs use all managed land
    - select pools and gases (dependent on method Tier)
    - select activities (eg nitrogen fertiliser)
  - This is not a surrogate for a complete national carbon budget. The quantum and variability in emissions from unmanaged lands would be too large for 'accounting' of anthropogenic emissions.

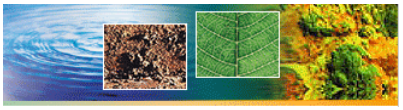


A patchwork – or a boundary encompassing a patchwork?

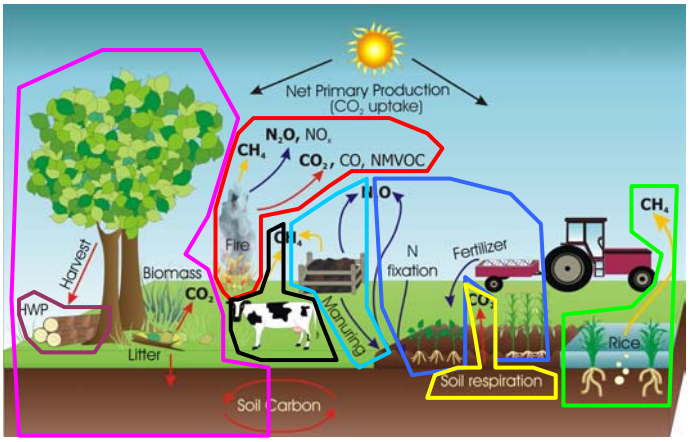
- A patchwork approach only exists at Approach 3 (spatially explicit time-series)
- Non-spatially explicit systems (Approach 2) infer representation within a broad and usually diverse land boundary (eg climate zone) – these are typically sampled not mapped
  - The Approach to land use representation determines the complexity of the patchwork
- Activity emissions boundaries do not always match land use boundaries (eg livestock in forests)
  - It is not a patchwork but a fragmentation issue

Lands, Activities and Gases

- Land Use (remaining and converted to matrix)
  - Provides a spatial stratification – but used only for stock changes (inferred as CO_2)
- Activities
  - Practices on land giving rise to non-CO_2 gases
- non-CO_2 contains some carbon and some activities release CO_2 (eg biomass burning)



Mixing stocks and flux logic – an enigma to mass balance?



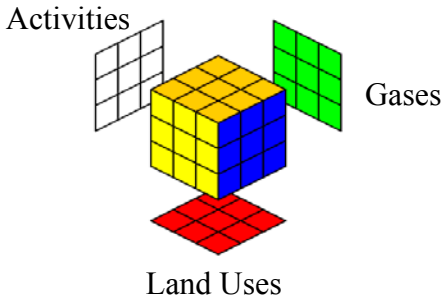
Mixing the stock change as CO_2 & non-CO_2 gas fluxes eg:
•the C flux of -- is the same C as the stock change of –
•some of the soil C stock change -- comes from –
•the C in – is a stock change in --

Mixed concepts

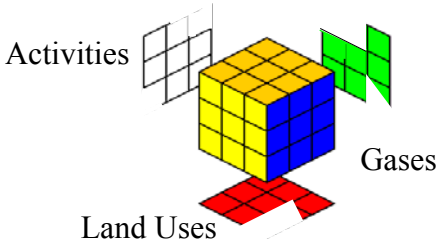
- Hybridizing land and activity concepts has created a multi-dimensional problem, with partial overlap between various dimensions
  - The genesis of independent land and activity inventory data collection components is likely
  - The difficulty is not in the spatial patchwork, but the fragmentation of lands, activity and gases without a single logic
- An integrated land systems approach (lands and the activities upon them) at a landscape scale for purpose of synergy with other resource goals may be a way forward
  - Ease of accounting and industry relevance

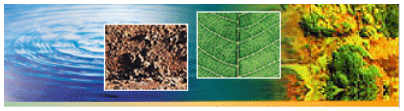
Is complexity drawn from the simplifying assumptions?

A consistent stratification base



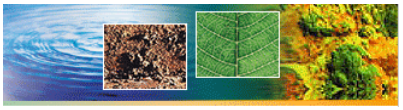
Variable strata for each dimension





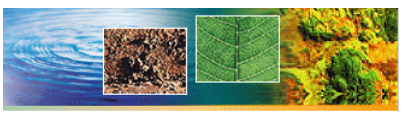
Why is there such a mix of land and activity reporting?

- Adoption of inventories for other purposes was OK for 1996 as the select elements inventoried were mostly independent
- GHG reporting was not a core government monitoring capacity at that time – and a *make do* approach was taken
- The more complete and complex policy framework has made this problematic, as elements begin to overlap (eg the activity of burning and carbon stock changes by land use are not independent)



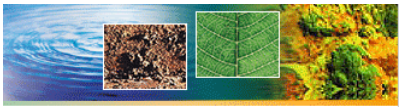
Evolution

- From 1996
  - Very select on the major items (and relevant lands)
    - Deforestation, savanna burning, woody biomass, livestock, non-CO_2 from soils etc
- To 2006
  - All emissions from all managed lands
  - Non-CO_2 from select activities
  - Comprehensive biomass burning from all lands and gases



The issue of scale – time for a reality check?

- Spatial
  - Do we still foresee the need for annual sub-hectare land cover and land use monitoring?
- Temporal
  - Do annual inventories measure actual annual emissions trends, or artifact of annual variability?
  - Will Governments and industry engage in frameworks where results are beyond their control because of natural variability?

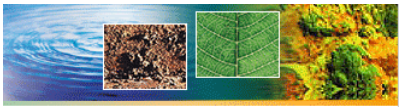


What is a realistic temporal frequency?

- Traditional inventories of land resources are not annual – they are rarely less than 5 year cycles
- Why then do we try to use these existing inventory methods for annual reporting?
- Do we start again with new methods that do this?
- Are actual annual emissions (and inherent annual variability) of interest or is it the longer term trends?

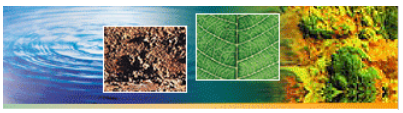
Anthropogenic, human induced and natural

- The source of many problems…especially if treated inconsistently for lands and activities.
- Can a solution be found that fits the many concepts around gases, lands and activities?
  - yes, but only if comprehensive, in a consistent way and if only lands with significant (in ratio) human induced emissions are included
- A *signal to noise* problem – there can be more variability in the natural than the anthropogenic emissions of interest – this is why annual variability is an issue
- Should we try to separate natural and anthropogenic, or be inclusive and deal with variability that arises?



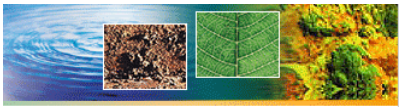
What are we asked to measure?

- Setting the goals:
  - Typically inventory design responds to performance requirements
    - At present GHG estimation typically adopts inventories done for other purposes – the relevance, eg temporal and spatial scale, thresholds, attributes have variable relevance
  - To harmonize the accounting framework (derived from policy goals) and technical design (which may be limiting) they should be mutually planned – not presumed to follow in sequence



The solution is the policy and technical harmonization?

- Technical method may limit policy flexibility, but should not determine the accounting framework.
- Technical methods can usually respond to the policy framework – a test of feasibility and cost.

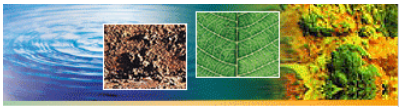


Can we trade relevance with simplicity?

- Do we really need to?
  - What are the threshold decisions re scientific accuracy and policy relevance.
  - Engagement – is making inventory easier promoting participation, or would clearer industry relevance be more effective?
  - Knowledge for mitigation - is it sufficiently progressed through forms of simplification and fragmentation?

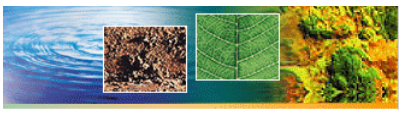
Tiers and Approaches – and the methods within

- Are we all measuring the same thing, but in a different way?
  - No, different tiers, approaches, methods and optional reporting elements limit country comparability
  - This should not compromise time-series consistency within an inventory (understanding trends)



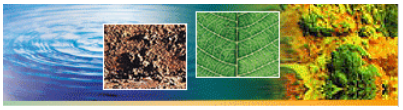
Key messages

- Harmonise policy goals with technical feasibility and cost
- Promote technical transfer, not over-simplified approaches
- Keep inventory consistent, logical, robust and relevant in preference to promoting simplified technical methods around complex policy frameworks



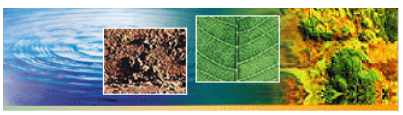
Where we want to be?

- Good governance is policy that can be monitored:
  - Political and industry engagement are fostered by tangible, robust and understandable evidence, and identifiable progress
  - Determination of policy effectiveness (cost-benefits of actions) needs measurable and attributable outcomes



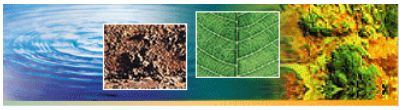
Is wholesale change needed or feasible?

- The creation of AFOLU is a major advance in accounting framework – but did the subsequent technical evolution reflect a harmonisation of method?
- There are challenges in the maintenance of existing time-series and cost of change – does the policy imperative justify change (a policy/political, not technical decision)?
- Bureaucratic and technical inertia to change should not be underestimated



The answers

- Is comprehensive accounting of carbon stock changes and associated greenhouse gas emissions and removals the way to achieve simplification?
  - *yes, but only if the comprehensiveness is systematic across all the parts and not fragmented. An integrated, systematic land systems approach could achieve this*
- Given that anthropogenic influences can extend to unmanaged areas, should accounting distinguish between managed and unmanaged?
  - *yes, unmanaged land introduces too much of both variability beyond human control and emissions that are not relevant to mitigation actions. This would work against participation in mitigation activities*



- Given that natural effects can result in both fluctuations and trends in carbon stocks, emissions and removals, how in practice can anthropogenic effects be identified and/or accounted for?
  - *if including all emissions from only managed lands and smoothing of annual natural variability is done, then this problematic separation is <u>not</u> needed*
- What level of detail is necessary to ensure that the response to policies and incentives response can be monitored for effectiveness?
  - *if a singular, unifying conceptualisation around land systems is taken that addresses industry sectors then much of the current complexity arising from fragmentation will disappear – a landscape scale will maximise synergies with other goals*