SUBMISSION FOR THE TALANOA DIALOGUE[1]

Ecosystem Integrity, Forests & Paris Agreement Goals

Where are we?

Keto, A., Mackey, B., Laurance, W.F. and Martin, V. (2018)

We face a global climate and biodiversity emergency. Just as the two problems are related and human induced, so too are many of the solutions.

We are in the midst of the 6th great extinction event. Biodiversity and related ecosystem health and resilience that underpin all life on Earth are under serious threat (IPBES 2018).

- **Rates of extinction**: are about 1000 times the likely background rate of extinction. Future rates are poised to increase (Pimm et al 2014).
- **Biological annihilation:** Beyond global species extinctions, Earth is experiencing a huge episode of population declines and extirpations, with negative cascading consequences on ecosystem functioning and services vital to sustaining civilization (Ceballos 2017).
- **Global wilderness areas:** Fell by one-tenth from 1993 to 2009 (Watson et al. 2016).
- **Collapsing core forests**: 70% now <1 km from an edge (Haddad et al. 2015).
- **Biodiversity Hotspots:** Half have just 3-10% natural intact vegetation (Sloan et al. 2014)
- **Habitat fragmentation:** Roads have chopped nature into 600,000 pieces (Ibisch et al. 2016);
- **Tropical fragmentation** is reaching critical thresholds (Taubert et al. 2018).
- Burgeoning human footprint**:** Tropics & agriculturally suitable areas declining fastest (Venter et al. 2016).

[1] The Talanoa Dialogue, launched in January 2018, was initiated by the United Nations Framework Convention on Climate Change (UNFCCC) as a facilitative dialogue among Parties to progress achievement of the Paris Agreement goals.

The resilience and 'permanence' of carbon stocks in land, forests and marine ecosystems depends on our ability to maintain naturally biodiverse, healthy and resilient ecosystems (ecosystem integrity).

Ecosystem carbon stocks are significant, with an estimated 1,652-2,385 Gt CO_2-eq in the world's remaining forests and 5,505-8,808 Gt CO_2-eq in soil; comparable if not greater than the estimated CO_2-eq in conventional fossil fuel reserves (~6,771) (Ciais et al. 2013). In a worst-case scenario, the biomass carbon emissions alone from complete deforestation this century could increase atmospheric concentrations by about 130–290 ppm (House et al. 2002). Current atmospheric concentrations are now above 400 ppm with only an additional ~50 ppm before the 2 degree warming safeguard is likely breached (IPCC 2014). Even if we were to cease all fossil fuel emissions tomorrow, there is more than enough carbon in forests, which if released, would overwhelm the global carbon budget for a limiting warming well below the 2˚C target.

Where do we want to go?

The 2016 UNEP Emissions Gap Report noted that the most urgent need is to achieve much deeper cuts in emissions before 2020, and that to limit warming to 1.5 degrees above pre-industrial levels required a further reduction (over and above the then current conditional and unconditional commitments in the Nationally Determined Contributions or NDC's) of 15-17 Gt CO_2.

The scale of this gap is prompting examination of all possible pathways to reduce emissions including unproven, high risk (to ecosystem and human heath), geo-engineering and 'Bioenergy Carbon Capture and Storage' (BECCS) proposals. The latter increasingly and alarmingly appears as a balancing item in climate pathways to limit global warming to 1.5 – 2 degrees.

While replacing fossil fuels with renewable energy sources, especially solar energy, is now an unavoidable and essential component of the necessary emission reduction pathway, avoiding emissions from deforestation and forest degradation, and improving sequestration through restoration of previously cleared forests and depleted forest carbon stocks, is equally necessary.

How do we get there?

We should encourage deep and profound improvements in managing all land and forests to improve ecosystem integrity and biodiversity protection, thereby helping to (1) prevent existing carbon stocks from being degraded and CO_2 emissions entering the atmosphere and (2) improving the sequestration, resilience and longevity of carbon storage. Supporting 'Natural Solutions to Climate Change' is therefore a high priority to achieve the required deep cuts in emissions.

Encouraging governments and providing financial and technical support for indigenous and local communities to develop sustainable livelihoods that help protect natural ecosystems and in particular primary forests should be the highest priority in the land and forest sector.

Global collaborative efforts are underway to identify pathways to foster the protection, restoration and buffering of primary forests that support local and indigenous communities (e.g., Griffith University Primary Forest & Climate Change Research Programme). Collective efforts are focused on detailed analysis of the condition and threats to Earth's primary forests in both developed and developing countries and the value of ecosystem services, including carbon storage, provided by these forests; and on how best to provide on ground, practical support for communities to protect and restore carbon stocks, biodiversity and other ecosystem benefits that would arise from improved management and protection of primary forests.

It is critically important that International policies, rules and investment criteria encourage action within NDC's that promote ecosystem integrity and deliver robust, resilient and relatively low risk mitigation, adaptation, community development, biodiversity and other benefits from forest protection and restoration.

The potential to foster ecosystem integrity through the development of high level principles in the Paris Rule Book - including accounting principles - applicable to all parties, that increase understanding about the linkages between biodiversity in natural systems, resilience and longevity of carbon stocks and the qualitative differences between agricultural systems and natural systems in the land and forest sector should be a high priority.

Principles that encourage the protection and restoration of biodiverse, resilient natural carbon stocks and encourage actions that deliver the most resilient, long-lived carbon storage in both developed and developing countries are needed. In the forest sector the most resilient, long lived outcomes for climate, biodiversity and ecosystem integrity would be delivered by (1) improved protection, buffering and reconnection of primary forests, supported by (2) regeneration and restoration of degraded natural forests, followed by (3) improved forest management in production forests.

It is important to recognize that wood production in primary forests damages ecosystem integrity and reduces the carbon stored in forests by 30-70% and that the loss of resilient, long-lived carbon stocks in primary forests cannot be offset by planting new, short rotation tree crops (Mackey et al. 2013; Mackey et al. 2015). It is also important to recognize that while encouraging management changes in the land and forest sector - that recognise and foster the links between improvements in biodiversity protection and resilient long-term carbon sequestration and storage are important, fundamental differences between ecosystem carbon dynamics and fossil fuel emissions make offsetting between these sectors, from a scientific perspective, problematic (Mackey et al. 2015). It is therefore important to ensure that offsetting allowed under current rules achieves the maximum benefit for environmental and ecosystem integrity as well as mitigation outcomes. For example, protecting primary forest from loss or degradation as well as linking forest restoration to buffering and reconnecting areas of primary forest would be far preferable offsetting pathways than planting new agricultural tree crops because (a) these actions help avoid emissions from forest loss and degradation and (b) they deliver resilient, long lived forest carbon outcomes.

Because of the potential perverse outcomes for climate, biodiversity and ecosystem integrity, the role of wood based bioenergy in climate mitigation needs extensive and careful scrutiny. There is strong evidence to suggest that wood based bioenergy is more emissive per unit of energy than coal and is already having profound adverse impacts on biodiversity and ecosystem integrity (Booth 2018).

In order to maintain and improve ecosystem integrity, it is important that all wood products and especially wood based bioenergy products, do not provide an economic incentive to log or clear forests that would otherwise remain standing or to increase the intensity of logging in production

forests. It is also critical to ensure that any and all emissions associated with logging and burning forests are transparent and fully accounted for and that wood based bioenergy is not falsely claimed to be either carbon neutral (which it is not) or renewable (which is difficult to achieve over relevant time frames) (Keith et al 2015). Application of the precautionary principle would suggest that no wood for bioenergy should be sourced from biodiverse natural forests.

Our assessment to date also suggests that encouraging integrated approaches to climate mitigation and adaptation, biodiversity conservation, ecosystem integrity and social and community development, as foreshadowed in the Paris Agreement, will be critically important to deliver climate solutions that underpin ecosystem integrity.

Strengthening integration of actions taken under all relevant global Conventions (UNCCD, UNCBD, UNFCCC and UNWHC) appears increasingly important so that they foster and support the goals of each other and encourage application of the Precautionary Principle to unproven technologies and to actions that would result in industrial scale land use change. Encouraging parties to adopt synergistic action to integrate the goals of relevant Conventions in their NDC's could help ensure that actions taken under one Convention do not undermine the goals and targets of another.

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