



<http://primaryforest.org/>

Nine Key Facts on Primary Forests, Carbon and Mitigation

1. Primary forests contain vast carbon stocks – far larger than logged forests or plantations.

- Forests store over 800 Gt of biomass carbon – more than the known carbon stocks of oil and coal combined, and more than is found in the atmosphere.
- Primary forests store 30-70% more carbon than secondary, degraded or plantation forests.
- A primary tropical forest on average stores about 250 t C per hectare, a logged forest stores about 150 t C (or less) and an oil palm plantation contains about 60 t C.

2. What matters most for mitigation is the carbon residency time in the forest – *not* the sequestration rate.

- Primary forests have larger carbon stocks than secondary forests or plantations because primary forests are dominated by longer-lived and old trees, which is where most of the biomass carbon is stored.
- The carbon stored in these large, old trees will be retained for centuries or in some cases millennia. Carbon in a plantation, a production forest or in short-lived pioneer species will be released in a matter of decades.
- Only a small percentage of logged forests ends up as a long-lived wood product (roughly 10%). Most wood products offer little or no long-term carbon storage and wood biomass for energy is immediately released into the atmosphere.
- Regenerating forests, forests recovering from disturbance and plantations sequester carbon at a high rate. However, it is not *the rate of sequestration that really matters: what matters most is how long that carbon remains sequestered.*
 - If all or part of the carbon is released in a few decades, as is the case with plantations or production forests, then the mitigation benefit is negligible.
 - If the plantation or production forest is replacing a primary forest, then a large carbon debt has been created which will take over a hundred years to repay.

3. Forest protection is a vital mitigation action.

- Time is of the essence: avoiding emissions by protecting forests with their long-lived carbon stocks is better than merely reducing emissions from ongoing forest degradation. Forest carbon is quickly lost, but slowly restored.
- Restoration of natural forests to help buffer, reconnect and improve the resilience of primary forests offers the most robust climate mitigation and adaptation outcome for landscape level restoration programs.
- Most of the biomass carbon in primary forests is stored in big, old trees that have been accumulating carbon for hundreds of years. Removal of these trees through logging greatly reduces primary forest carbon stocks (even with reduced-impact, selective logging), which is a key reason why carbon stocks in primary forests are so much higher than in secondary regrowth and plantations forests.

4. The superior mitigation and adaptation benefits of primary forests are related to their stability, resilience and adaptive capacity, which is derived from their natural biodiversity and ecological integrity. Primary forests are the lowest risk forest carbon stocks and the safest forest carbon investment.

- Their high level of ecological integrity means primary forest canopies exert a strong control on micro-environmental conditions, buffering the ecosystem from extreme weather events, including droughts, and inhibiting fire.
- The natural biological diversity of primary forests enhances their resilience and adaptive capacity, which together with strong micro-environmental stability, means that primary forests are the lowest risk carbon stocks compared to those of regrowth and plantation forests, and therefore the safest investment for forest carbon mitigation projects.
- Primary forests are more likely to support populations of key seed dispersers, including mammals, frugivorous birds, which are essential for the regeneration of many tree species, including tropical hardwoods. Over-hunting of seed dispersers, which is often the result of increased access to forests from logging roads, severely impacts regeneration, in turn potentially leading to a reduction in long-term carbon stocks.

5. Primary Forests are the most biodiverse terrestrial ecosystems on the planet and are more diverse than secondary forests or plantations.

- Primary forests, especially in tropical biomes, support different kinds of species compared to regenerating and plantation forests. Pioneer and secondary tree species are faster growing and short lived, storing less carbon.
- This does not mean secondary forests are unimportant. A secondary forest can support significant biodiversity, especially if it is adjacent to a primary forest that can act as a source habitat, and secondary forests provide beneficial ecosystem services.
- The fact that a primary forest has been degraded should never be used as a pretext for deforestation. Degraded forests can be ecologically restored and over long periods of time the quantity and quality of the ecosystem services can be increased.

6. The protection of primary forests and ecological restoration of secondary regrowth forests are critical to a climate-safe future.

- The world community faces a big mitigation gap: the total mitigation that nations have committed to under the Paris Agreement is significantly less than the global carbon budget that will limit warming to well below 2 degrees let alone 1.5 degrees above pre-industrial levels. Forest protection and restoration could provide up to 4 Gigatons of mitigation per year for several decades, thus making a substantial contribution to global efforts to limit warming in line with Paris Agreement commitments.
- Given the amount of carbon stored in natural forests and in particular primary forests, we must end deforestation and primary forest degradation as soon as possible, in addition to phasing out the use of fossil fuels.

7. Primary forests are critical to the restoration agenda.

- Primary forest patches in fragmented landscapes act as a refuge and source habitat for forest interior species, providing both the seed bank and the seed dispersers necessary to enable resilient and cost-effective restoration of nearby degraded forests and reforestation efforts.
- They are important anchors around which integrated landscape restoration projects can be designed and implemented that meet the aspirations and sustainable development needs of indigenous and local communities.

8. Industrial logging is not sustainable in primary forests, even when certified.

- The fact that an industrial logging operation is certified does not mean it is sustainable. Certification indicates compliance with best-practices: it does not indicate that primary forest values, including carbon stocks, biodiversity and other critical ecosystem services (e.g. water quality) are maintained. The vast majority of certified logging operations in the tropics are not sustainable and likely never will be without massive subsidy.
- Studies confirm that in the tropics, hardwood species targeted for logging in industrial concessions are commercially extirpated within 2-3 rotations under typical rotations.
- Only about 11% of forests globally are certified, and of this, only 10% is in the southern hemisphere. Most logging in the tropics is illegal.

9. Protecting primary forests meets the requirements for additionality.

- It is increasingly difficult to find a forest that is not, or will not soon be threatened by natural resource extraction, infrastructure development, food production or human settlement.
- Taking action to protect primary forests now meets additionality requirements because active management is needed (e.g. legislative measures, governance mechanisms, management structures, financing etc.) to safeguard ecological integrity.