AirClim
Air Pollution & Climate Secretariat

NORTHERN FORESTS

PROTECTING NORTHERN FORESTS: CRUCIAL FOR BIODIVERSITY, THE CLIMATE AND INDIGENOUS RIGHTS

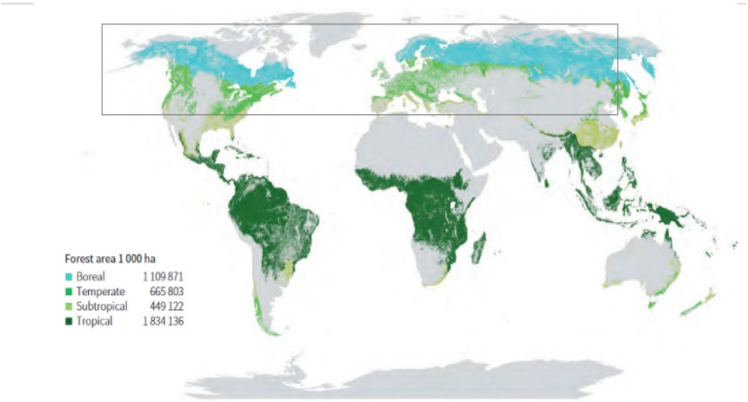
Forests are incredibly valuable for life on earth. They host over 80% of terrestrial biodiversity, store over 850 gigatonne of carbon - equal to almost a century of fossil fuel emissions - and are home to 300 million people, many belonging to vulnerable communities and indigenous nations.

This value has been recognised multiple times by the world's governments such as in the 2015 Paris Climate Agreement, the 2022 Kunming-Montreal Global Biodiversity Framework, and most recently in the outcomes of the Climate Convention's first Global Stocktake which highlighted the need to enhance “efforts towards halting and reversing deforestation and forest degradation by 2030”.

Unfortunately these statements have not stopped the decline of the world's forests. While overall the rate of forest loss has been reduced, we are still losing approximately 10 million ha of forests (equal to the size of South Korea) each year. Similarly the amount of carbon stored in forests is going down and recent studies indicate that trees and lands nowadays emit as much carbon as they absorb. And contrary to popular belief, while the carbon stored in tropical forests is growing (+30% in the last three decades), the decline is mainly in what we call northern forests (-40% in boreal forests in the last three decades).

Northern forests

Northern forests encompass the boreal and temperate forests of North America (Canada and the US) and Europe (including Russia and the former Soviet Union member states). These northern forests make up a large part of the world's global forests as they represent over 40% of global tree cover. Three countries, Russia, Canada and the US make up for around 85% of all northern forests. Adding the EU27 to this group brings the total to around 95%. Thus preserving northern forests is mostly a responsibility of industrialised countries (and northern forests form the majority (+90%) of developed country forests).



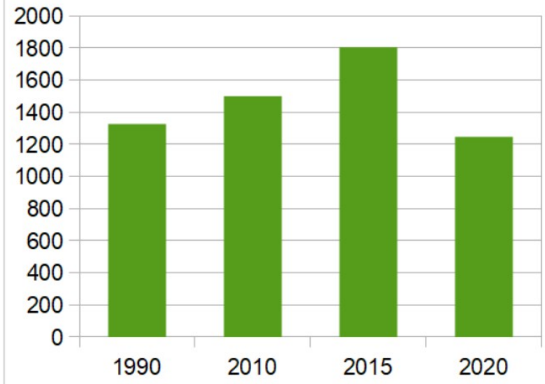
Northern forests hold nearly half of the global carbon stock. Different from tropical forests, whose carbon stock is predominantly in living biomass, a very large part of the northern forests' carbon is stored in their soils. Northern forests hold among the last large stretches (over 50%) of primary, old-growth, and mature forests. These primary forests have never been industrially logged or otherwise disturbed by human activity, and have a unique and irreplaceable value for global biodiversity. Northern forests hold numerous species of coniferous and deciduous trees, shrubs, grasses, and species of fungi and lichens and billions of birds breed in or migrate through these forests each year. Boreal forests alone shelter more than 85 species of mammals, 130 species of fish, 32,000 species insects and 300 species of birds.

Numerous indigenous peoples depend on and survive in northern forests. Millions of indigenous people,

belonging to such nations as the Gwich'in, Dene, Cree and Innu in Canada and Alaska, the Coquille and Paiute in the US, the Saami in Northern Europe and the Buryats and Yakut in Siberia both use the forest for their economic and spiritual needs and contribute to conserving, managing and restoring northern forests. Multiple studies have indicated that forests controlled by indigenous peoples are better protected and have more carbon stored, with the level of protection increasing when forest ownership gets legally recognised.

Under threat

Table: evolution of net carbon removals from northern forests (in $MtCO_2$)(source: FAOSTAT, Forest land-Forest Emissions, 2024)



Northern forests are also experiencing some of the world's fastest degradation, due in large part to industrial logging in primary, old-growth, and mature forests. Logging in northern forests is the world's single largest industrial driver of gross tree cover loss. As a result, northern forests are more vulnerable to the impacts of climate change, such as increased forest fires and insect outbreaks. This in turn is reducing the amount of carbon stored in northern forests. While northern forests accounted for 40% of forest carbon removals in 1990, this has dropped to 24% today. Even more, some countries, such as Canada, Finland and Germany have seen their forests turn from being a carbon sink (absorbing more carbon than they emit) into a source (emitting more carbon than they absorb).

Forest degradation

As opposed to tropical forests, which face a high level of deforestation (whereby forests are replaced by other forms of land use), northern forests suffer most from forest degradation. It is therefore very helpful that the first Global Stocktake called for halting and reversing forest degradation by 2030. However, a generally recognised definition of forest degradation is missing. Hence a number of NGOs and scientists have developed the following definition of forest degradation: "*Anthropogenic disturbances resulting in the immediate or long-term loss or deterioration of the ecological integrity of a forest, measured at multiple scales, including stand and landscape level, and using a non-industrially impacted naturally regenerating forest as a baseline. These disturbances include impacts to 1) native species abundance and composition; 2) forest structure and functioning; 3) tree age-class distribution; 4) carbon stocks and other ecosystem services; and 5) adaptive capacity.*''

Potential of northern forests in climate mitigation

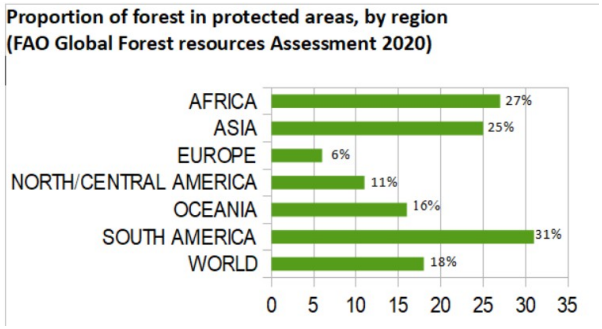
In addition to phasing out fossil fuels as quickly as possible, increased removals of carbon from the atmosphere will be needed to achieve the objective of limiting temperature rise to 1.5°C. Forest ecosystems are the main (or even the only) driver of such removals and their potential to store even more carbon is huge. The Intergovernmental Panel on Climate Change (IPCC) estimates that reducing deforestation and forest degradation can cut global emissions by over 4.5 $GtCO_2$ a year, and afforestation and reforestation by 2Gt CO_2 a year, between now and 2050. Other estimates show a significantly higher potential, with up to 9.5$GtCO_2$ of emission reductions per year from halting and reversing deforestation, the equivalent of 15 % of current global greenhouse gas emissions. The carbon removal capacity of northern forests can thus be increased by three types of action: increasing forest protection and restoration; changing forest management practices; and increasing forest cover through afforestation and reforestation.

Protect remaining forests

As indicated above, protecting and restoring forests, and in particular the remaining old-growth and primary forests, must be a first priority in safeguarding biodiversity and the carbon sink of northern forests. Protecting and restoring forest ecosystem integrity is the fastest and most cost-effective way to deliver win-win outcomes for climate, biodiversity, and indigenous peoples. Protected areas, and in particular those managed by indigenous peoples have proven to be highly effective and provide complementary approaches for protecting

and restoring ecosystem integrity.

Unfortunately however, northern forests are under-protected and less than 10% of northern forests are considered protected areas. This is far below the world's average of 18% and even further away from the Global Biodiversity Framework's objectives. There is thus an urgent need for increased efforts in recognising indigenous peoples' lands, establishing protected areas and restoration of degraded forests.



Change to sustainable management practices

Reducing forest degradation by shifting to sustainable forest management practices can enhance the role of northern forests in climate mitigation. Since the middle of the 20th century the dominating management model in northern forests is rotation forestry, using clear-cutting as harvesting method. Since this model has been able to increase annual yield while at the same time maintaining or even increasing growing stock it is often labelled as “sustainable forestry”. However, sustained yield is not equal to ecological sustainability. From an ecological point of view the rotation forestry model has created severely degraded forests. This, in turn, has negatively affected biodiversity and other important ecosystem services than providing timber (for example water balance and climate mitigation).

Several studies show that from a short- or medium-term perspective ecosystem-based forestry management benefits the carbon balance and carbon stock of forests compared to rotation forestry using clear-cutting as harvesting method. For example, a Finnish study concluded that over 100 years closer-to-nature management models stored in average over 20 percent more carbon per ha than conventional rotation forestry. An obvious reason for this is that such models work with far bigger growing stock than rotation forestry. Another reason is that clear-cutting as such has adverse climate effects. When trees are logged part of the underground biomass dies and starts to decompose. This makes clear-cutting a carbon source for at least 10 -15 years after logging. Even if new forests are planted as soon as possible, it will take another decade or two for this to compensate for this initial loss.

Furthermore, the claim that an increase in timber production will facilitate further substitution of fossil fuels and fossil-demanding materials, such as steel and concrete should be challenged. Studies supporting this view are usually based on time perspectives that cover one or more forest rotation periods, i.e. 100 years or more, which is of limited interest in a situation where the challenge is to meet targets for 2030 and 2050. There is growing scientific support for the conclusion that substitution effects of present forestry cannot compensate for the negative impact of logging on the carbon sink, especially not in the short and medium time.

A radical shift in forest management, ensuring climate friendlier close-to-nature forest management practices, should be envisaged. Close-to nature forest management, ecosystem based forestry and eco-forestry are similar management models. Based on a number of scientific sources, the following principles have been proposed as the basis for ecological forestry:

* **continuity** - the provision for continuity in forest structure, function, and biodiversity between pre- and post-harvest ecosystems during regeneration harvests;
* **complexity** - the need to create and maintain structural and compositional complexity and biological diversity, including spatial heterogeneity at multiple spatial scales through all silvicultural interventions;
* **timing** - referring to the importance of applying silvicultural interventions at ecologically appropriate time intervals;
* **context** -underscoring the importance of planning and implementing silvicultural interventions in the context of objectives developed at larger (landscape) spatial scales.

In other and simpler words ecological forest management aims at maintaining forests in a way that they resemble as much as possible natural forests.

Reforestation and afforestation

Reforestation and afforestation expands the forest area, which in turn increases carbon sequestration as the new forests grow. In the international climate policy process reforestation and afforestation is widely advocated as a principal tool to increase the terrestrial carbon sink. In their NDCs, the national commitments under the Paris Agreement, northern forest countries have reported targets for reforestation and afforestation summing up to 162 million hectares (until 2050).

Model analyses of the role of the land-use sector in meeting the 1.5^{oC} target also usually stresses the importance of reforestation and afforestation. One reason for this is that the models used (IAMs, Integrated Assessment Models) usually do not take the potential effects of protection and improved management of forests and other ecosystems into account.

Relying heavily on reforestation and afforestation to increase the forest carbon sink is a strategy that comes with considerable risks. A 10 % increase of the total northern forest area (as assumed by the models and NDCs) over the next 25 years may have negative impact on other ecosystems (such as grasslands) and their biodiversity, and compete with broader sustainability goals such as ensuring food security.

Recommendations for CBD COP16 and UNFCCC COP29 (and COP30)

While forest protection is clearly a task for national, regional and indigenous peoples' governments, there are a number of actions and commitments that can be made at the international level that could help further the protection of northern forests and strengthen their role in supporting biodiversity, climate change and indigenous peoples rights.

1. At COP16 (CBD) governments should adopt decisions on both 'Cooperation with international organizations and bodies established under other conventions' and on 'Biodiversity and climate change' in order to **foster stronger synergies in the planning and implementation of national climate, biodiversity and land restoration plans**, strengthen coherence among NBSAPs, NDCs and NAPs and strengthen collaboration between the secretariats of the UNFCCC and the CBD. This should be followed by similar statements of support to strengthened collaboration at COP29 (UNFCCC);
2. At COP29 (UNFCCC) governments should ensure that the annual dialogues on the outcomes of the Global Stocktake **monitor and report on the implementation of the forest commitments** (paragraph 33), and include these commitments in further debates on the integration of the Global Stocktake outcomes into future Nationally Determined Commitments (NDCs);
3. At COP29 governments should agree to include the **role of forests in climate mitigation in the future agenda of the Mitigation Work Programme** so that in particular actions to protect and restore forests during the rest of this decade up to 2030 can be highlighted;
4. At COP29 governments should agree on the **establishment of a multidisciplinary ad-hoc Technical Expert Group mandated to advise and support governments in implementing Article 5 of the Paris Agreement**, which deals with ecosystems and in particular forests, by operationalizing the concept of ecosystem integrity;
5. At COP29 governments should adopt clear safeguards under Article 6 of the Paris Agreement (dealing with carbon markets) that ensure that **avoiding greenhouse gas emissions from forests and/or increasing removals through forests protection cannot be used to offset greenhouse gas emissions from the use of fossil fuels**;
6. At COP30 governments should **adopt a forest accountability framework** establishing clear metrics, guidelines and indicators for all drivers of deforestation and land degradation, for developed and developing countries which should form the basis for annual, country-led reporting on rates of deforestation and land degradation;
7. At COP30 governments should agree to **establish a Forests and Climate Change Dialogue**, which could operate in a similar way as the Oceans and Climate Change Dialogue, aiming at providing a forum to discuss action to conserve and enhance sinks and reservoirs of greenhouse gases in the world's forests, as well as monitor progress on action to halt and reverse deforestation and forest degradation.