

# COMMUNIQUE ON TROPICAL FORESTS from the InterAcademy Partnership (IAP)

## EXECUTIVE SUMMARY

There can be no solution to climate change without addressing deforestation. But we are facing a situation of continued high rates of deforestation, as seen in recent reports of fires burning in the Amazon basin and elsewhere.

While the Amazon forest fires have attracted intense global attention, fires in Africa and Asia are of equal concern. Recent figures reveal that deforestation is responsible for 13% of global carbon dioxide emissions, equivalent to the emissions of many mid-sized countries.

Primary drivers for deforestation are human activities such as intensive agriculture, timber, mining and bioenergy, often driven by market forces. However, climate change, with its increases in temperature, drying, climate extremes and lengthening of the fires season, increases the risk via a negative feedback loop.

Healthy forests interact with their local climate in a positive feedback loop, so that deforestation may reduce the ability of the climate to support the forest. This will have deleterious knock-on effects on ecosystems and agriculture in the regions surrounding the forests.

It is critically important to protect and increase forest cover as the most effective short-term means of moderating atmospheric CO<sub>2</sub> levels. Restoring forests and reversing deforestation are also key to reducing biodiversity loss.

REDD (Reducing emissions from deforestation and degradation) and other international measures to reduce/halt deforestation have not yet proved effective. Government policies of the host nations are critical as there is a strong relationship between rates of deforestation and political leadership, regulations, enforcement and the size of fines. Achieving zero deforestation and maintenance of forest integrity are global issues and contribute to 'global solidarity'.

The challenge is not just to slow or halt deforestation, however. There should be a massive programme to restore the integrity of much of the area that has been lost.

This IAP analysis puts forward a number of measures that could contribute to forest protection and reforestation efforts around the world.

According to IAP, necessary measures needed to protect and restore tropical forests include:

1. Reduce fossil fuel use – to avoid further climate change that will exacerbate forest drying and increase susceptibility to fires.
2. Understand the underlying factors of deforestation – for example through satellite monitoring. Support the tenure and rights of indigenous peoples.
3. Apply knowledge effectively – for example, through balances in policies regulations, incentives and disincentives.
4. International support measures, including raising awareness on the effects of demand by consumers in developed countries for commodities such as beef, soybean, palm oil, biofuels etc., as well as eliminating the importation of illegally logged tropical timber.
5. Provide financial incentives for forest conservation and financing for climate change mitigation and adaptation.
6. Revisiting REDD (Reducing emissions from deforestation and forest degradation), the aim of the international community should be to aim for 'Reversing' emissions from deforestation and degradation.'

In 2009, IAP released a Statement, endorsed by 53 academies of science from around the world: <https://www.interacademies.org/13954/IAP-Statement-on-Tropical-Forests-and-Climate-Change>.

The Statement highlighted the fact that there can be no solution to climate change without addressing deforestation and made a series of six recommendations to global policy-makers.

Now – 10 years later – we are facing a situation of continued high rates of deforestation, as seen in recent reports fires burning in the Amazon basin and elsewhere.

In 2018, tropical deforestation accounted for about 13% of global carbon dioxide (CO<sub>2</sub>) emissions, at 5.3 GtCO<sub>2</sub>/year. Many factors are responsible for driving deforestation, including shifting agriculture, and clearing land for agricultural commodities, forestry and urbanization. All these drivers make use of fire for clearing the land.

**In response to the ongoing global crisis surrounding the issues of deforestation and forest burning, the IAP makes the following comments:**

**1. While the Amazon forest fires have attracted intense global attention, the incidence of forest fires continues to affect the rest of the world.**

Examples of human-instigated fires include:

- The Amazon fires in 2019 were the highest in number and radiative power since 2011 and extended from Brazil to include neighbouring countries, especially Bolivia.
- Indonesia continues to be affected by large numbers of fires impacting not only Indonesian forests but creating regional smogs that caused widespread disruption in neighbouring countries including Malaysia and Singapore during September 2019.
- Fires in tropical forests of India increased from 4,225 in November 2018 to 14,107 in February 2019 according to the Real Time Forest Alert System of the Forest Survey of India.
- The setting of thousands of fires each year by traditional farmers across sub-Saharan Africa is historically separate from the rainforests issue. However, a lack of access to traditional grasslands is driving increased slash and burn clearing of forests in parts of Africa.

**2. Forest fires are a major source of greenhouse gases on a scale matching or exceeding the emissions from many mid-sized countries.**

- Tropical deforestation accounts in 2018 for about

13% of global carbon dioxide (CO<sub>2</sub>) emissions, at 5.3 GtCO<sub>2</sub>/year.

- The 1997 Indonesian fires burnt 8 million hectares and released 0.81-2.57 GtCO<sub>2</sub>. In the Arctic and sub-Arctic in 2019, emissions in June alone from the 100+ fires being observed by the Copernicus Atmosphere Monitoring Service (CAMS) emitted ~50 MtCO<sub>2</sub>. Brazil's emissions in 2015 from forest (and savannah) fires were ~200 MtCO<sub>2</sub>, and the number of fires up to September in 2019 is 60% higher than in 2015 and almost doubles that in 2018. Note that while forests represent the largest fraction of fire-based emissions, substantial fires are also occurring in savannah areas such as Brazil's Cerrado and in Paraguay.

**3. Primary drivers for deforestation are human activities, but climate change with its increases in temperature, drying, climate extremes and lengthening of the fires season, increases the risk.**

- For example, land clearance for agriculture – in Brazil for soya and cattle; in Indonesia for palm oil – is a major cause of deforestation followed by biomass burning. These are exacerbated by population pressures which drive the search for additional land, and also by global trade shifts (such as increased demand for soya as a result of US-China trade friction). In India, forest fires may be set by communities to promote grass growth, to clear areas for shifting cultivation, or to clear the forest floor to collect non-timber forest products, etc. or due to arson especially for hunting wildlife or encroaching forest land.
- Fires in boreal forests which have not been set by human intervention have also been increasing. Temperatures in the Arctic and sub-Arctic have been increasing at a much faster rate than the global average, and warmer conditions facilitate fires and with larger persistence once they have been ignited by natural events such as lightning. Large emissions of carbon dioxide and methane occur, but the fires can also lead to accelerated ice melt due to black carbon deposition on snow that lowers the reflectivity and increases heat absorption.
- Furthermore, the increased susceptibility of forests to accidental ignition (e.g. power line sparks, cigarette butts, etc.) has increased the scale and speed of forest fires in areas such as California, where the 2018 fires burnt 766,000 hectares. Early detection by the MODIS (Moderate Resolution Imaging Spectro-radiometer) sensor onboard the Aqua and Terra Satellites of NASA

is important to fast action by forest departments.

#### **4. Forests interact with their local climate so that deforestation may reduce the ability of the climate to support the forest.**

- Reduced forest cover has important economic and environmental consequences: the evapotranspiration of the Amazon rainforest releases more water into the atmosphere daily than that released by the Amazon River itself. Part of this humidity flows to Central and Southern Latin America, regions that are responsible for 70% of the continent's gross domestic product (GDP) and productive agrobusiness activities. If the Amazon no longer produces rain for the country's crops, Brazil will have an estimated trillion-dollar loss over the next 30 years. For the same period, projections show reductions in soybean production by 25-60% and reductions in pasture productivity by 30%. There is a possibility that the Amazon could be close to a tipping point where the viability of the remaining tropical forest and its self-generating local and regional climate is threatened, which would lead to a large-scale irreversible switch to a savannah biome.

#### **5. Continued high rates of deforestation are in contrast to the critical importance of protecting and increasing forest cover as the most effective short-term means of moderating atmospheric CO2 levels.**

- Recent Global Assessments (IPCC SR1.5, IPCC SRCCL) show that reforestation and avoided deforestation are key measures to reduce atmospheric CO2 concentrations. Restoring forests and reversing deforestation are also key to reduce biodiversity loss. In contrast, deforestation continues and incentives to increase the carbon stock in forests are in conflict with increasing demands for forest bioenergy.
- There is an imperative to restore forests in large areas on deforested or degraded land with the aim to increase the ecosystem functionality and resilience, conserve biodiversity, sequester carbon and mitigate effects of global climate change. Guidelines on reforestation and afforestation are needed, and could be based on principles that restoration interventions should have proper objectives for the enhancement and diversification of local livelihoods; that afforestation should not replace native tropical grasslands or savannah ecosystems; that reforestation approaches should promote landscape heterogeneity and biological diversity; and that residual carbon

stocks should be quantitatively and qualitatively distinguished from newly established carbon stocks. More effective global efforts to combat tropical species extinctions require high-quality, objective information on tropical biodiversity, without which conservation strategies cannot be assessed, and the role of forest governance determined.

#### **6. REDD (Reducing emissions from deforestation and degradation) and other international measures to reduce/halt deforestation have not yet proved effective, so Government policies of the host nations are critical.**

- Social science studies have showed the strong relationship between political leadership, regulations, enforcement and the size of fines, and the rates of deforestation. Other research has also showed that the administrative system for fines is also critical since even when fines are made, there appeared to be many barriers to their imposition and a majority may not even be collected.
- Many studies also confirm the escalating effects of infrastructure provision, e.g. new roads, which provide enhanced access to farming, logging and mining, etc. The resulting forest fragmentation increases exposure to fire risks which accelerates the pace of deforestation. The construction of new infrastructures is determined by national and regional government policies and the strength of their implementation which, through their effects on deforestation, have global implications.
- In contrast to such findings, Brazil has recently enacted a series of major changes to its environmental policies, including heavy cuts to government agencies that enforce environmental protection laws. As would be expected from the results of previous studies, the resulting lack of surveillance has encouraged farmers (and other interests, including mining and logging) to set fires to clear land in primary forests, leading to the increase in deforestation that has affected both protected areas and indigenous lands. About 20% of the Amazon's forest cover has already been lost, and it is estimated that this figure could reach 40% by 2050, if no action is taken.

#### **International Policy Responses**

In response to the 2019 increase in Amazonian fires, seven South American countries have agreed measures to protect the Amazon River basin. Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru and Suriname signed a pact, establishing a disaster

response network and satellite monitoring, and also agreeing to work on reforestation. Brazil has a commitment in the Paris Agreement to reforest 12 million hectares by 2050. In South-east Asia, the ASEAN Agreement on transboundary haze pollution is one response to forest fires to be mitigated through concerted national efforts and international cooperation.

This IAP analysis suggests a number of measures which could contribute to effective implementation of such agreements as well as to forest protection and reforestation efforts around the world.

## Principles and Goals

- Recognize that forest are not just sinks for carbon and providers of water vapor, they also provide essential ecosystem services, providing fresh water, shelter, flood prevention or mitigation, and forest products such as food and medicines.
- The challenge is not just to slow or halt deforestation but there should be a massive programme to restore the integrity of much of the area that has been lost by seeking rapid implementation of the Bonn challenge targets and their further strengthening during the proposed United Nations Decade of Ecosystem restoration from 2021.
- From an international standpoint and that of climate change, all tropical forests are critically important. Achieving zero deforestation and maintenance of forest integrity and biodiversity are global issues and relate to global agreements on limiting climate change, desertification and biodiversity (inter alia), and contribute to 'global solidarity'.

## Necessary Measures

### 1. Reducing fossil fuel use

- Reducing fossil fuel use is essential to preserve tropical forests. In a world 3-4 degrees warmer, survival of tropical forests would be at risk. The forecasted changes in precipitation and temperature will affect forest health and could lead to significant loss of carbon stored in tropical forests.

### 2. Understanding the underlying factors

- Monitoring of deforestation using modern tools such as remote sensing technologies, such as those being used by Global Forest Watch, is important and should be maintained and strengthened. Channeling data from the sources to operational organizations (e.g. forestry

departments, research institutions and NGOs) should also be strengthened.

- Protecting carbon stocks in tropical forests also requires protecting the fauna which is responsible for the dispersal of the seeds of many species of large trees contributing to the forest's carbon stock.
- Indigenous tenure and rights are being violated across Latin America and elsewhere as land is being 'grabbed' for so-called 'development'.
- Strong market forces are driving deforestation (intensive agriculture, timber, mining, bioenergy, etc.). There is a need to classify and understand each of these drivers, which are in conflict with measures for forest and landscape restoration (FLR). Countries and organizations implementing FLR initiatives should extensively monitor carbon stocks by providing technical and financial support for multiple surveys organized by FLR programs, and establish scientific monitoring guidelines for evaluating landscape-scale carbon stocks and other related FLR outcomes.
- Implementing REDD+ to reduce deforestation requires different approaches for dry and wet forests. Community-based organizations have an important role for the implementation of REDD+ in dry forests where generally a small number of local people degrade the forests. On the other hand, deforestation in wet forests is dominated by large enterprises, requiring a more centralized governing body including internationally certified groups and national governments.
- Land and forest managers must pay more attention towards the multiple uses of forests and their sustainability. Information on the effect of climate change in tropical biomes is still limited and must be merged with human feedback effects. For instance, in Madagascar, farmers experiencing crop failures due to less rain decided to produce charcoal by cutting trees and thus accelerated deforestation rates.

### 3. Applying our knowledge effectively

- A "Carrot and Stick" approach requires a balance between governmental subsidies and business drivers of deforestation, combined with well-enforced laws and penalties for transgressors.
- Subsidies that (directly or inadvertently) encourage land clearance should be replaced by incentives for reforestation.
- Evidence that deforestation is linked to organized crime and corruption should steer policies to be resistant to such dangers.

#### 4. International support measures

- Deforestation is linked to consumer demand in developed countries through consumption of beef/soybean/palm oil etc., as well as importation of illegally logged tropical timber and demand for biofuels. A global response and global responsibility/awareness of the linkages, and implementation of national measures to protect and support actions in forest-critical countries is required. This may include barcode technology that can enable commodities to be traced to their sources and allow businesses and consumers in developed countries to choose sustainably-produced goods.
- The goal of the international community should shift from REDUCING emissions from deforestation and degradation to their REVERSAL, so that REDD would become 'Reversing emissions from deforestation and degradation'.

#### 5. Financing forests preservation and climate change mitigation and adaptation

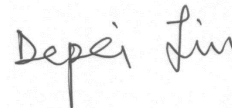
- There are no mechanisms that reward countries or stakeholders that are conserving forests. Thus, there is a need to develop financial incentives for forest conservation. Likewise, agroforestry, where trees are grown with cash crops, can provide an additional strategy for climate change mitigation and adaptation and should be better supported than at present.
- Existing measures to reduce deforestation (REDD) have made some progress but have not been able to stem the continued high rates of deforestation. International action under REDD and successor schemes is thus as important as ever. The aim of the international community should be to aim for 'Reversing' emissions from deforestation and degradation.

### Signed by the members of the Steering Committee of the InterAcademy Partnership, December 2019

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IAP would also like to thank the contributions of three peer reviewers of this document – from Benin, China and the USA.

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Other references and data sources are available at:

<https://www.interacademies.org/58917/Tropical-Forests-additional-references-and-data>

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