the
INTERACADEMY PANEL
on international issues
iap
a global network of science academies

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IAP STATEMENT ON TROPICAL FORESTS AND CLIMATE CHANGE

Headline Messages:

- There can be no solution to climate change without addressing deforestation;
- Deforestation must be addressed now, not later, if we are to meet an 80% CO_2 reduction target by 2050;
- Forests play a critical role in the climate system by providing a natural carbon capture and storage function and by regulating rainfall patterns; sustainable forest management can make a major contribution to climate change mitigation;
- Deforestation of tropical forests accounts for around 17% of global carbon dioxide emissions: a failure to address this source of emissions will significantly compromise global efforts to tackle climate change;
- Intact and healthy forests provide food, energy, water, shelter and flood protection services, reducing the vulnerability of rural populations to climate change and enabling adaptation to climate impacts;
- Funding developing countries to maintain their forests, using already available methodologies, capacity and funds, will offer new opportunities for generating wealth and ending poverty;
- Any agreement reached as part of the UNFCCC negotiations must respect the rights of forest dwellers and forest dependent peoples when designing and implementing schemes, and promote sustainable development pathways that do not involve deforestation.

1. Deforestation and the global carbon cycle

Tropical forests and the soils beneath them provide one of the world's largest terrestrial carbon stores but are being degraded and deforested at the average rate of 8-15 million hectares per year. About 1.5 Gt of carbon, equivalent to 17% of global anthropogenic carbon dioxide (CO_2) sources, is released due to these activities each year.

Undisturbed tropical forests provide a natural carbon capture and storage function – sequestering the equivalent of approximately 15% (1.3 Gt) of global anthropogenic carbon emissions annually. The preservation of this free service should be as high a priority in climate mitigation strategies as the development of expensive carbon capture and storage and bioenergy technologies.

However, the capacity of this natural sink is already being compromised by climate change. Unless greenhouse gas (GHG) emissions are abated, some climate models suggest that the tropical forest sink may diminish and even reverse as some forest areas become savanna and forest fires increase worldwide due to hotter and periodically drier environmental conditions. Under these conditions, large quantities of stored carbon would be released into the atmosphere in a potentially dangerous positive feedback accelerating climate change. The resilience of tropical forests to climate change would be enhanced by action to reduce forest degradation and to maintaining large areas of primary forest.

2. The Mitigation Opportunity

G8 leaders agreed in early 2009 to limit global warming to 2 °C and to cut greenhouse gas emissions by 80%. To achieve this ambition by 2050 will require immediate and dramatic emission reductions of around 17Gt CO_2e versus business-as-usual by 2020. The global forest sector could provide up to 7.8 GtCO_2e/yr of abatement potential by 2030, primarily in developing countries and mostly through reducing deforestation. Curbing deforestation, alongside fossil fuel mitigation, could therefore play an important role in limiting global GHG concentrations to below 450ppm CO_2e and delivering the 2 °C target.

In the longer term, protection and restoration of the world's forests (reforestation), as well as sustainable management of secondary forests, can make a major contribution by removing CO_2 from the atmosphere. Diverse plant communities generally take up more carbon from the atmosphere than communities consisting of just one or a few species. Restoration (through natural or human-assisted means) of degraded ecosystems, through equitable reforestation and afforestation with native species, can also increase sequestration.

3. Deforestation and mass extinction

Carbon is assimilated in the forest canopy and is stored in trees, roots and soils; a process that is a function of complex biodiversity. Forty percent of global terrestrial biodiversity exists high in tropical forest canopies alone. However, deforestation and over-exploitation in tropical regions are major contributors to the sixth global mass extinction event. The loss of this store of genetic diversity will compromise the capacity of all life on earth to adapt to human-induced climate change.

Protecting forests is a win-win policy option, as reducing deforestation not only decreases both the rate and magnitude of climate change, but will also mitigate biodiversity loss. This protection should include safeguards against the conversion of natural forests to forest plantations when accounting for biodiversity, since biodiversity is still profoundly affected with consequent effects on the flow of goods and services from these forests.

4. Ecosystem services provided by tropical forests are immense

Ocean acidification is a direct consequence of increasing atmospheric CO_2 concentrations. To avoid substantial damage to Deforestation costs an estimated $2-5 trillion per year in lost ecosystem services. Tropical forests cool the atmosphere not only by absorbing and storing carbon but also through evaporating vast quantities of water, which form clouds that reflect solar radiation. Water recycled in this way is delivered across immense distances providing rainfall which underpins food and energy security, from agriculture and hydropower respectively. Deforestation could alter rainfall distribution locally and more widely, affecting agriculture thousands of miles away. Paying for tropical forest ecosystem services represents a major economic opportunity for developing nations. Indigenous and forest peoples, as well as community forestry, should be the major beneficiaries of efforts to reduce deforestation and restore tropical forests through compensation schemes, given their reliance on forest ecosystem services and their role in forest stewardship.

5. Maintaining tropical forests increases community resilience to climate change.

Biodiverse tropical forests provide important ecosystem services such as food, water, shelter, flood prevention or mitigation, disease control and cultural wealth for rural populations. Tropical forests support the livelihoods of 1.4 billion of the world's poor. Recent extreme events such as droughts and floods indicate that these people are highly vulnerable to climate change, and that maintaining tropical forests increases community resilience to climate change.

6. Technology and methodologies are available to monitor deforestation effectively.

Monitoring, reporting and verification of deforestation and forest degradation in developing countries is achievable, albeit challenging, using existing scientific and traditional knowledge. Forest monitoring and carbon measurement methods are ready for large scale deployment to reliably detect deforestation and measure carbon emissions, respectively. New satellite missions will further enhance the detection of forest degradation, but further improvements in scientific infrastructure, including earth observation systems and the development of standardized methodologies, alongside skills development of forest communities, are required to ensure reliable, transparent and systematic measurement of deforestation.

7. Governmental subsidies and business drivers of deforestation need to be re-set.

Consumer demand in developed countries is increasingly responsible for forest loss in the tropics. Western countries, for example by setting legal targets for the mixture of biofuels with gasoline, are driving the conversion of some tropical forests to oil palm plantations. One outcome of such policies is a significant increase in the extent of fire-induced carbon release through burning of peat-rich forest soils. Together, activities of these kinds lead to GHG emissions which are greater than those arising from the use of gasoline alone. To meet climate targets, reforms will be necessary to promote the sourcing of commodities without clearing natural forests for land and to minimise emissions from land use change. Consumer, business, and investor driven 'forest footprints' should be reduced by creating demand for sustainable production and certification of supply. Governmental subsidies which currently encourage deforestation should be re-set to stimulate restoration of land, while providing the incentives necessary to keep forests standing. The introduction of innovations, such as chip and barcode technology which enables commodities to be traced to their sources, will allow businesses and consumers in developed countries to choose sustainably-produced goods. Coordinated raising of environmental standards across sectors, in particular the prohibition of high-impact selective timber harvesting, would improve sustainability within competitive markets.

Through coordinated land use management, the ever increasing demands for timber, food and biofuels can be met without the need for further deforestation. This requires coupling of forest regulation to ensure long-term sustainable low-impact timber production, with steps designed to increase food production on previously deforested areas. All reforms should be designed to respect the rights and needs of forest dwellers and forest dependent peoples, and implemented with their free prior and informed consent.

8. Financing forests and climate change

Estimates from the major studies agree that emissions from tropical deforestation can be cut by 50% in 2020, at an achievable annual cost of $15 - $35 billion. Developed countries will need to help developing countries implement reforms as part of their move to a low-carbon development path, through a mix of public and private funding, and with careful monitoring and review to determine the balance of the two in future. Innovative market-based financing mechanisms should also be encouraged such as specialized funds, rainforest bonds, and insurance products, to supplement public funding.

9. Recommendations:

We, the academies of science working through the InterAcademy Panel on International Issues (IAP), call on world leaders to:

1. Acknowledge that reducing deforestation is a vital and urgent part of the international community's effort to deliver climate change mitigation commitments by 2020 and to deliver longer term climate adaptation, poverty alleviation and maintenance of ecosystem services provided by biodiversity. Such forest mitigation must be in addition to reductions in fossil fuel emissions by Annex I countries.
2. Ensure that the proposed UNFCCC Reducing Emissions from Deforestation and Forest Degradation (REDD) mechanism is a vital and integral part of the post 2012 climate framework to be agreed in Copenhagen in December 2009, including transparent and robust monitoring systems to verify emissions reductions.
3. Fund research to help target political and economic interventions – for example, on the effective cultivation of valuable forest species – as well as encourage more cooperation on earth observation to improve the accuracy of monitoring and evaluation of deforestation.
4. Set up an emergency funding mechanism for avoided deforestation and sustainable forest management to assist forest-rich developing countries in their climate mitigation and adaptation efforts.
5. Implement land reforms and other measures to reduce deforestation, forest degradation and the drivers of deforestation urgently as a vital component of reducing emission rates of greenhouse gases by 80% of 1990 levels by 2050.
6. Engage forest dwellers and forest dependent peoples in designing and implementing deforestation and degradation reduction schemes, including the provision of alternative rural livelihoods for those currently engaged in deforestation-related activities.

The following academies have endorsed this statement

- TWAS - The academy of sciences for the developing world
- Albanian Academy of Sciences
- National Academy of Exact, Physical and Natural Sciences, Argentina
- The National Academy of Sciences of Armenia
- Australian Academy of Science
- Bangladesh Academy of Sciences
- Academia Nacional de Ciencias de Bolivia
- Cameroon Academy of Sciences
- RSC: The Academies of Arts, Humanities and Sciences of Canada
- Academia Chilena de Ciencias
- Croatian Academy of Arts and Sciences
- Academy of Sciences of the Czech Republic
- Academy of Scientific Research and Technology (ASRT) Egypt
- The Delegation of the Finnish Academies of Science and Letters
- Union of German Academies of Sciences and Humanities
- Deutsche Akademie der Naturforscher Leopoldina
- Ghana Academy of Arts and Sciences
- The Academy of Athens, Greece
- Academia de Ciencias Medicas, Fisicas y Naturales de Guatemala
- Indian National Science Academy
- The Indonesian Academy of Sciences (AIPI)
- Academy of Sciences of the Islamic Republic of Iran
- Royal Irish Academy
- Accademia Nazionale dei Lincei, Italy
- Science Council of Japan
- Islamic World Academy of Sciences
- African Academy of Sciences
- The Korean Academy of Science and Technology
- National Academy of Sciences of the Kyrgyz Republic
- Latvian Academy of Sciences
- Lithuanian Academy of Sciences
- Mauritius Academy of Science and Technology
- Academy of Sciences of Moldova
- Montenegrin Academy of Sciences and Arts
- Academy of Science of Mozambique
- The Royal Netherlands Academy of Arts and Sciences
- Academy of the Royal Society of New Zealand
- Nicaraguan Academy of Sciences
- Nigerian Academy of Sciences
- Palestine Academy for Science and Technology
- Academia das Ciencias de Lisboa, Portugal
- Romanian Academy
- Académie des Sciences et Techniques du Sénégal
- Serbian Academy of Sciences and Arts
- Academy of Science of South Africa
- Royal Swedish Academy of Sciences
- Academia Sinica, Taiwan, China
- Tanzania Academy of Sciences
- Turkish Academy of Sciences
- The Uganda National Academy of Sciences
- The Royal Society, United Kingdom
- US National Academy of Sciences (NAS)
- Latin American Academy of Sciences