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## Reflections on the 15th World Forestry Congress, "Building a Green, Healthy and Resilient Future with Forests", Seoul, Republic of Korea, 2–6 May 2022



Organized by the Food and Agriculture Organization of the UN (FAO) and the Korea Forest Service, the World Forestry Congress was a remarkable event for a number of reasons.

With approximately 15,000 participants from over 160 countries, it was the largest World Forestry Congress to date. It was also the first to be held using a hybrid format, with online streaming services for approximately 5,000 delegates unable to attend in person. The participants were a remarkably diverse group of all ages, from students to international dignitaries, representing governments and public agencies, international organizations, the private sector, academic and research institutions, non-governmental organizations (NGOs), and community and Indigenous organizations.

Postponed by a full year due to the ongoing coronavirus pandemic, extraordinary precautions were taken for the health and safety of visiting delegates and the local population in the wake of a dramatic spike in Covid-19 cases in Korea in the months immediately preceding the Congress. This considerable uncertainty that

the Congress could be held as planned, limited the number of international colleagues participating in person. In spite of these challenges, the local organizers led by the Korea Forest Service rose to the challenge, creating a memorable, well-organized and exciting Congress at the COEX Convention and Exhibition center in Seoul.

The Congress program was compelling, forward-looking and inclusive. One of its main aims was to define the role of forests in the 2030 Agenda for Sustainable Development and other major agreements, including the Global Forest Goals, the Paris Agreement on climate change, and the post-2020 global biodiversity framework. Developed over several years by an extraordinary team at FAO in collaboration with numerous partners (among others, the member organizations of the Collaborative Partnership on Forests), it included a wide variety of sessions and events organized along six subthemes:

- Turning the tide: reversing deforestation and forest degradation
- Nature-based solutions for climate change adaptation and mitigation and biodiversity conservation
- The green pathway to growth and sustainability
- Forests and human health: revisiting the connections
- Managing and communicating forest information and knowledge
- Forests without boundaries: enhancing management and cooperation

### **CFA Newsletter**

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*Speaker at the Ministerial Forum on Sustainable Wood*

The Congress provided a much-needed forum for the exchange of knowledge, perspectives, and visions on these and other key issues among the diverse communities within and outside of the forest sector. These included scientists, educators, forest managers, civil society, youth, policy makers, communicators and the public. Discussions throughout the Congress were remarkably open and did not shy away from contentious issues.

The outcomes of the Congress were similarly unambiguous and will, hopefully, inspire us all towards effective action in the years ahead. They included action proposals related to the six sub-themes of the Congress; a Ministerial Call on Sustainable Wood; a youth call for action; and the Seoul Forest Declaration. The Declaration presents a clear set of messages regarding the critical roles that forests and trees outside of forests play in enhancing food security and nutrition, providing abundant and clean water for people, making our cities more livable, halting and reversing land degradation, promoting sustainable production and consumption, and of course, helping to address both the climate and biodiversity crises that threaten our survival. Importantly, the Declaration outlines shared roles and responsibilities for ensuring a sustainable future for the world's forests and peoples.

Among the key messages emerging from this Congress is the need for those of us in the forest sector to work more closely and constructively with our colleagues in other natural resource sectors – including agriculture – and with policy makers, the private sector, civil society organizations, communities, and youth to tackle the urgent challenges facing forests and all who depend on them either directly or indirectly.

Forest science and engagement of Indigenous and local communities were also highlighted throughout these discussions as being fundamental to effective conservation, sustainable management and restoration of the world's forests in the face of the urgent challenges we face. So too was the need to more fully value and respect the traditional knowledge, experience, insights and innovation of these communities, as well the social and cultural capital that underpins it. Related to this, one of the highlights, for me at least, was the inspiring presentation ceremony for the 2022 Wangari Maathai Forest Champions Award presented to Ms Cécile Ndjebet, Founder and President of the African Women's Network for Community Management of Forests (REFACOF).

Another message from the Congress was the need to foster greater awareness and support from the public, whose personal and collective decisions have significant direct and indirect impacts on forests and their governance. Effective communication about the forests and their many benefits, as well as greater support for forest education at all levels, from school children to university students and forestry professionals, were highlighted in this regard.

Finally, the Congress was notable for its positive – often celebratory – atmosphere. Part of this was due, no doubt, to the superb efforts of the Congress hosts, staff and young volunteers whose hospitality and attention to detail, from assisting delegates in countless ways to the spectacular cultural programs staged during the Congress, made this a special event for all those fortunate enough to participate. But it was also clear that for so many delegates, myself included, the Congress offered a deeply appreciated pandemic-delayed opportunity to once again meet old and new colleagues and friends, share knowledge, experiences and perspectives, and to be energized in the process. And it came at a very good time, when the combination of multiple environmental crises, economic and social pressures, military conflicts, and political turbulence is perhaps testing our resilience, and our spirit. The solidarity and commitment that was very much part of the experience of the World Forestry Congress will hopefully inspire us to redouble our efforts towards building a greener, healthier and more resilient future with forests.

**John Parrotta**

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## Forest Scenes

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### Helicopter Science

#### INTRODUCTION

**W**ell-deserved attention is being directed at the long-standing ethical problem of outsiders carrying out research in ways that do not adequately compensate their hosts. Various referred to as helicopter, parachute, parasitic, postal, safari, colonial, or neocolonial science, much of the focus is on

international abuses indicated by failure to include locals as authors, but the problem occurs whenever researchers from a dominant culture exploit people in marginalized communities. Here I discuss a diversity of ways to minimize damage due to power imbalances in science. I outline some of the responsibilities of the various parties that directly and indirectly condone, allow, commit, and suffer from helicopter science. I also caution

against using absence of local authors as the sole indicator of helicopter science.

I feel qualified to discuss this ethical problem partially because, although I've yet to parachute into a study site, I'm guilty of the other violations. These breaches of what I now recognize as ethical science practices were mostly early in my career and attributable as much to youthful enthusiasm as to disregard for the welfare of my hosts; I've long since striven to redress the power imbalances that allow helicopter science practices to persist. I also recognize that it is easy for well-established researchers to preach against helicopter science and that it can be challenging for early-career researchers to avoid, especially those with limited funding and those conducting research in which there is little local interest.

There are many reasons to avoid perpetuation of helicopter science. First of all, taking undue advantage of hosts risks engendering bad feelings about science among non-scientists while inspiring distrust of visitors among local scientists. In some cases, the hostile receptions encountered by well-intentioned researchers result from the actions of generations of culturally insensitive colonial and neocolonial scientists. Another reason to avoid helicoptering is that research designed to address local problems suffers greatly without local collaborations both in the quality of recommendations and the likelihood of uptake (Costello and Zulma 2000).

Decolonizing science is a worthy endeavor that requires a diversity of mitigation strategies due to the diversity of host characteristics, variation among scientists in power and resources, and where the research falls on the spectrum of curiosity-driven to problem solving. While I deplore the fundamental inequalities among scientists in funding as well as in access to equipment and information, I also recognize that these disparities are not disappearing; the first step is to increase awareness of the need for ethical behavior by visiting scientists.

#### **RULES FOR AVOIDING HELICOPTER SCIENCE**

Advice on avoiding helicopter science is now available in published articles with titles such as 'Grounding the helicopters' (Giller 2020), 'Ten simple rules for Global North researchers to stop perpetuating helicopter research in the Global South' (Haelewaters et al. 2021), and the delightful mixed metaphor 'Closing the door on parachutes and parasites' (Lancet Global Health 2018). These and other publications (e.g., Minasny et al. 2020, Pettorelli et al. 2021) focus on situations that involve visiting and local scientists among whom collaborations should start at the research planning stage and culminate in co-authored publications. Rather than repeating the advice in these papers, my intention here is to draw attention to other sorts of situations and solutions that need not involve co-authorship.

#### **COLLABORATION CHALLENGES**

Other than where previous experience with exploitative visiting scientists and unrelated political/cultural clashes have poisoned the well, true collaborations – that is, from design to publication – are relatively easy to secure in countries with well-developed and at least moderately well-funded scientific institutions with plenty of potential research partners. In such places, co-development of research proposals through co-production of publications should be the norm (Haelewaters et al. 2021). The alternative of securing local collaborators for already developed research projects relegates locals to roles as technicians and

logistical coordinators, which demeans them while contributing little to local research development (REF).

Lack of ready and able local collaborators is often used as an excuse for continued neocolonial science even in countries with established but underfunded research communities. For example, I worked for several years at a famous and well-funded research station hosted by a developing country in the tropics where few host-country scientists were engaged. Senior scientists at that institution, all expatriates, complained that their attempts to engage local researchers failed, so they were off the hook. It only became clear to me later that efforts to involve locals often failed because university-employed scientists needed paid consultancies to cobble together living wages and salary top-ups were disallowed, which precluded their effective collaboration.

Where local researchers have been transformed into highly paid consultants by international projects, the cost of local collaborators can exceed the budgets of all but the best funded researchers. Under such conditions, potential collaborators likely remain among junior scientists.

Collaborators may also be challenging to find for esoteric research that does not figure among local research priorities; such research might be an unaffordable luxury for locals and engaging them in projects that do not address local concerns can even be damaging. For example, several decades back in Southeast Asia I watched with dismay when host country scientists at a governmental research institution with a mission to improve forest management were diverted to addressing the academically compelling but practically inconsequential questions related to the maintenance of tree species diversity in natural forests. Several local scientists were listed as authors on published papers, but at a cost to their institution's mission. I witnessed an even worse example of this phenomenon in South America when a visiting team of well-funded fluvial hydrologists absorbed much of the attention of an entire research organization that employed no scientist in this field.

I hesitate to stereotype, but as a driven American academic I often found it challenging to collaborate with more senior researchers employed by governmental research institutions in the tropics as well as closer to home. The challenges typically derived from our very different work cultures supported by different reward structures coupled with their bearing responsibilities that I did not share.

#### **AUTHORSHIP IS AN IMPORTANT BUT OFTEN INADEQUATE AND SOMETIMES INAPPROPRIATE INDICATOR**

The most familiar metric of helicopter science is co-authorship; here I argue for a broader range of ways to mitigate the damage done. My concern is that while authorship is bibliometrically tractable and revealing (e.g., Stocks et al. 2008; Hazlett et al. 2020), failure to include local authors is not always an indicator of helicopter science. I also worry that inclusion of local 'gift' authors is an expeditious but unethical way that researchers guilty of helicopter science can avoid this sort of scrutiny. Finally, authorship is not of value to some, especially non-academic collaborators.

Where authorship is the appropriate currency, criteria for authorship need to be revised to account for the ascendancy of open-access data, satellite-based studies, and multi-site comparisons while addressing the core problem of neocolonial



science (REF). In discussions about authorship with students I still often start with the old-fashioned idea that authorship is deserved by anyone who contributed at least three of the following five to the research: came up with the idea, collected the data, analyzed the data, drafted the manuscript, and secured the funding. Employment of this now outmoded criterion excluded from the ranks of authors the critical people who secured the research permits, arranged the logistics, acted as linguistic and cultural translators, and supplied critical local knowledge about the place, phenomenon, species, or ecosystem studied.

Ironically, pressure to include local researchers among increasingly long lists of co-authors has unwittingly engendered a group of professional co-authors that contribute little but benefit from 'gift' authorships. The phenomenon of 'token authorship' provides a new twist to the problem of 'author parasitism' and may do more harm than good.

## **OTHER WAYS TO AVOID AND MITIGATE HELICOPTER SCIENCE**

Among the many possible ways to avoid helicopter science, some should suit both visiting scientists and their hosts. Where experienced local scientists are not available to mentor or the community of scientists is especially small, for example, contributions to local capacity-building can be a suitable way to avoid helicopter science. My recommended focus is on training of researchers, not just field assistants; building competent cadres of technical and field staffs (e.g., para-taxonomists) is great, but not at the expense of the elevation of local scientists (Putz et al. 2018). If substantial mentoring is involved, priorities need to be shuffled, which can be difficult due to time and budget constraints. Thankfully, at least some funding agencies are beginning to recognize that helicopter science is unethical and will allocate funds to its avoidance.

Contributions to infrastructure development are great but should not be used to avoid the need for true collaborations that enhance local research capacities. Years back I worked at a research institution in the tropics where one group of visiting scientists was allowed to act with complete autonomy because their government had contributed several expensive and sophisticated pieces of equipment. Ironically, that equipment was not used due to lack of trained technicians and instructional manuals printed in a language unintelligible to the recipients; this seems like a variety of 'donor robbery' (Costello and Zumla 2000).

## **RESPONSIBILITIES IN EFFORTS TO AVOID HELICOPTER SCIENCE**

### **International Organizations and Professional Societies:**

Through supplemental agreements to the Convention on Biological Diversity, The United Nations exercises a leadership role in efforts to combat helicopter science related to the use of genetic resources (i.e., Nagoya Protocol, Cartagena Protocol on Biosafety, Bonn Guidelines). These and other policies are well intentioned, but strict rules often fail to accomplish their goals, can inspire cumbersome work-arounds, and sometimes result in perverse outcomes. Assuring that these policies are fair and non-arbitrary undoubtedly is a continuing struggle, but efforts to protect intellectual property and to promote equitable benefit sharing are commendable.

**Funders:** Funding agencies should strive to rectify historical geopolitical inequities in the international community of science

(Costello and Zumla 2000) and facilitate development of equal research partnerships. To demonstrate that they are exercising their moral responsibility to help build research institutions in the countries and regions where the projects they fund are carried out, they could stipulate that the research be carried out through local institutions. To avoid the common criticism that visiting scientists never bother to return their results to their hosts, funds should be reserved for this purpose. To assure public access, researchers funded by the National Institutes of Health (NIH) in the USA are required to upload their papers to an open-access digital archive within 12 months of publication (<https://www.nih.gov/health-information/nih-clinical-research-trials-you/what-is-nih-public-access-policy#:~:text=The%20Public%20Access%20Policy%20ensures,.gov%2Fpmc%2F>). Funded researchers should also be expected to publishing in local outlets, present seminars, and give guest lectures in their host area. Finally, funds for exchange programs should be made available; such experiences help solidify collaborations and help young scientists establish research networks.

I am still irked by a comment by the panel on an unsuccessful grant I submitted to the U.S. National Science Foundation two decades back. The proposal was likely flawed in numerous ways, but I was shocked by the criticism that too much funding was allocated to building Bolivian science, which seems like an endorsement of helicopter science; I can only hope that the NSF has long since mended its ways. Happily, the Dutch funding agency (NOW-WOTRO) has taken steps towards curtailing the abuses that stem from unbalanced power relationships among scientists (Giller 2020); researchers with approved pre-proposals are funded to organize compulsory workshops at their study sites in which local collaborators and other stakeholders participate.

European Union: <https://www.globalcodeofconduct.org/>  
This is the one that seems most threatening to many kinds of science and scientists....I worry about the lack of flexibility.

**Publishers and Journals:** Despite some recent advances, poorly funded researchers around the world are still often stymied by the cost of publishing. As a gesture towards reducing power imbalances, page charges could be on sliding scales indexed by World Bank estimates of gross national income per capita or waived for researchers from developing countries, as is the policy of journals such as *Molecular Biology and Evolution* ([https://academic.oup.com/mbe/pages/Open\\_Access#apcs](https://academic.oup.com/mbe/pages/Open_Access#apcs)). Restricted access to published research also solidifies the disproportionate power of the wealthy; despite great programs like Research4life (<https://www.research4life.org/>) and efforts like that of 'coalition S' (<https://www.coalition-s.org/about/>) to require research funded by public grants be published in open access journals or otherwise made immediately available, many publications remain behind paywalls.

Journals could also help in the campaign against helicopter science by requiring explicit and transparent rationales for authorship decisions and statements about how helicopter science was avoided. They could also provide more free or at least heavily discounted help for authors for whom English is not their first language and assure that manuscripts are not rejected solely on the basis of the quality of their prose.

**Research Institution Administrators and Senior Scientists:** Responsibility for educating researchers about helicopter science should be shared by administrators especially those who run international programs. While assisting researchers with the administrative challenges of conducting research abroad, they should provide clear guidance on matters related

to helicopter science. The responsibility for teaching young scientists about what neocolonial science looks like and how it should be avoided falls squarely on the shoulders of senior scientists. Professors set the tone in their labs by encouraging students to collaborate early in their research careers.

**Research Hosts:** While the anti-helicopter science literature focuses on abuses by visiting scientists, research hosts (e.g., property owners, families, clans, ethnic or cultural groups, regional or national governments, universities, research institutions, and regional and national governments) have responsibilities as well. In particular, those who host researchers need policies and protocols that strike a balance between being so burdensome or strict as to unnecessarily impede or even preclude research and being so loose as to allow helicopter science to continue.

Two examples of host communities that have taken upon themselves to codify what they consider respectful interactions with researchers are the ‘San Code of Research Ethics’ (Schroeder et al. 2020) and the ‘Institutional Review Board of the Cherokee Nation’ (<https://irb.cherokee.org>). The clarification of core values embodied in these documents should serve to promote equitable benefit sharing between researchers and the hosts on whom they depend.

#### FINAL WORDS

Collaborations in which all parties equitably benefit are often challenging and time consuming. Good advice is available, but the difficulties should not be diminished. For visiting scientists to find appropriate compensatory mechanisms beyond co-authorship, they need to take the time to develop a degree of cultural competence. The key point is that there is no single

solution to the helicopter science problem. What needs to be emphasized is that the problem deserves to be recognized and solutions sought.

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## The International Tree Foundation: planting trees for a hundred years

*‘A world where trees are valued and forest flourish for  
the benefit of people and planet’*



*Tending a tree nursery at Kakamega, Kenya*



In 1922, environmentalism was not in vogue and planting trees to support communities was rather an unusual thing. Yet this was the vision of conservationist Richard St Barbe Baker and Kenyan Chief Josiah Njonjo when they jointly set up *Watu wa Mitu*, 'People of the Trees'. The organisation quickly evolved and grew into what today is known as the International Tree Foundation (ITF), which this year celebrates its centenary. The legacy is rich, not only encompassing the direct planting under the organisation's auspices but also through the numerous other bodies that it spawned internationally, notably in the Commonwealth. From the *Save the Redwoods* campaign in North America to the *Green Front* campaign to reverse the expansion of the Sahara, St Barbe Baker inspired people around the world. For those who would like to delve deeper into the history, a unique archive has been established at the University of Saskatchewan, Canada, documenting St Barbe Baker's achievements (see <http://stbarbe.library.usask.ca/>).

### Working through communities

Today, ITF continues its important mission with a particular focus on East Africa as well as the UK. With staff in Kenya and the UK it works closely with a large number of organisations ranging from Botanic Gardens Conservation International to the AFR100 initiative and the Evergreening Alliance. ITF's focus remains firmly on community-led models and the multiple benefits of tree planting and restoration.

Long years of experience have shown ITF that it is not simply a numbers game. Real sustainability is only achieved when communities are in the driving seat and feel responsible for maintaining the environment around them – and for this to happen they need to see direct benefits. So, ITF's projects involve and empower local people with a particular emphasis on community choice and women's leadership. Rural communities have a sophisticated understanding of their relationship with the natural world and can take concrete steps to maximise livelihood opportunities and the multiple environmental, climatic and biodiversity benefits of tree planting and restoration. It is also about planting the right trees, suited to the specific conditions, that will thrive.

### Avoiding a race to the bottom

There has never been a time where there has been stronger public awareness about the preciousness of our planet and the precariousness of life upon it. There has never been greater interest in tree planting. Yet there is a risk of a race to the bottom – where the focus becomes simply on planting the maximum number of trees for the lowest possible cost.

It is important to remember that especially where reforestation is concerned, it is not simply about planting a tree in virgin soil and sitting back and waiting for the rains to come and for it to grow. Following a recent trip to Kenya, CEO, James Whitehead blogged about the back-breaking work to remove the deep roots of the invasive *Lantana camara* weed which had overtaken an erstwhile forest on the slopes of Mount Kenya. Many days of hard labour with pangas were required before saplings could be planted.

Doing things right takes time and patience. This could take the form of working with women to get a better understanding of their access to natural resources and how they can benefit from income generation activities to detailed GPS mapping

and monitoring. It could be the patience required in establishing local community tree nurseries rather than relying on large-scale commercial vendors to ensure that money and expertise stay at the local level. Doing things right might entail working with government research agencies and other expert agencies to provide training in effective propagation of threatened species through seed collection programmes. Or alternatively, it may be relatively straightforward to plant trees in local schools – but the value of doing so is not just that a physical tree has been planted but that a new generation is engaged and inspired. For ITF, quality matters, impact matters.

### Working in Africa

In recent years ITF has worked in a wide range of African countries such as Tanzania, Cameroon, Kenya, Uganda, Zambia, Malawi, Ghana and Madagascar. Forest loss has led to reduced biodiversity, droughts, flash floods, crop failures and more. That is why it was encouraging that this year the Kenyan government announced that tree cover has risen to 12% from only 7% just a decade ago. ITF has been working closely with the Kenyan government to contribute to this measurable shift in tree cover across incredibly diverse biomes, ranging from highlands to drylands and wetlands. One example is the Saiwa Swamp National Park where decades of unsustainable practices such as eucalyptus planting, the use of artificial fertilisers and illegal wood harvesting have severely damaged the wetlands ecosystem. ITF has been working with the Kipsaina Crane and Wetlands Conservation Group (KCWCG) to mobilise and inspire community groups in the buffer zone to conserve and rehabilitate the park and has run a planting programme, bolstering tree management skills with local farmers.



*Tree planting in Saiwa Swamp National Park, Kitale, Kenya*

Another project, in Rwanda, focuses on the Gishwati Forest where ITF works through the Forest of Hope Association (FHA), another grassroots organisation, to promote tree conservation. A global biodiversity hotspot, the forest has suffered serious degradation as a result of illegal mining, poor agricultural practices and deforestation. The project is creating a buffer zone of indigenous trees along the southern edge of the forest. Training is provided to community members on tree nursery development, seedling production and horticulture and native tree and fruit seedling are being distributed to local groups.

### Where now?

ITF is firmly focused on continuing and expanding community-based tree-planting and restoration through the next hundred years. ITF will continue with significant projects in more developed countries, such as the Trees in the Cities Project launched at COP 26, but will also deepen and grow its impact in Africa. The focus on quality will continue. More work is needed on women's empowerment in natural resource management; there are opportunities to integrate fuel efficient stoves to reduce pressure on forests for firewood; there are new ways that technology can help strengthen the work. Crucially, ITF remains convinced that nothing beats working with the people on the ground whose welfare and livelihoods depend on good forest management. Only in this way is there real sustainability.

*"Today it is the duty of every thinking being to live and to serve not only their own day and generation, but also generations unborn, by helping to restore and maintain the green glory of the forests of the earth."* – ITF founder, Richard St. Barbe Baker.



**James Whitehead**

CEO, International Tree Foundation  
[www.internationaltreefoundation.org](http://www.internationaltreefoundation.org)

## How the Commonwealth can lead by tackling deforestation to create a greener more prosperous future for our planet

For over seven decades, the Commonwealth has united countries around the world under the shared values of democracy, human rights and the rule of law. Just as that spirit of unity and cooperation has been used to protect the rights and dignity of people around the globe, today we must direct that energy towards another crisis: protecting our planet's biodiversity and reversing the impact of climate change.

Commonwealth nations have some of the world's most biodiverse landscapes. The deep rainforests of Guyana, open savannahs of Kenya, the vast Great Barrier Reef in Australia are just a fraction of the ecological treasures held throughout the Commonwealth. Therefore, the Commonwealth is uniquely placed for its nations to work together to combat climate change.

A key challenge faced by many Commonwealth nations is the threat of deforestation. The need for raw materials, such as timber and agricultural products like palm oil, is one of the primary drivers for deforestation and the scale of the problem cannot be understated. Between 2015–2020, over a million hectares of forest were destroyed worldwide. Approximately 2,400 trees every minute. Which is why I was pleased to co-sponsor the Food Labelling (Environmental Sustainability) Bill in the UK Parliament, which urges food manufacturers to label products to indicate the environmental sustainability of their origins. This aims to help consumers in Britain make more informed choices about the sustainability of the products they buy, thus helping to reduce deforestation globally.

On the ground, the impact of deforestation can be seen first-hand in the Okavango Upper Zambezi Transfrontier Conservation Area (KAZA) – a protected area encompassing Angola, Botswana, Namibia, Zimbabwe and Zambia. Although not as widely reported as the deforestation occurring in places like Brazil or Indonesia, deforestation in the KAZA region is driven by many of the same factors, such as agricultural use and charcoal production. Unsustainable use of these landscapes has been a disaster for the wildlife in the region, which contains some of Africa's largest populations of endangered species, including elephants, rhinos, lions and hippos. The impact of this destruction does not end here. Indigenous people who make up

the rich cultural landscape of the Zambezi region have stewarded these forests, not only relying on them for food and shelter but also for protection from environmental hazards like flooding. This is not limited to the KAZA region, nor those living a traditional lifestyle. Globally, some estimates suggest that over 90% of those in extreme poverty rely on forests to survive. The wanton destruction of the earth's forests puts the lives of the world's most vulnerable at direct risk.

A key project that is already underway to try and restore our forests is the Queen's Commonwealth Canopy (QCC) which was launched in 2015 with the goal of uniting protected forestry areas across the Commonwealth in one unbroken line. Protected areas range from the small botanical gardens of Singapore to the vast expanses of the Great Bear Rainforest on the Pacific coast of Canada. I have also been pleased to contribute to this initiative by marking The Queen's Platinum Jubilee and *planting a tree for the Jubilee* with children from Flash Lee Community Primary School in my Stafford constituency. This tree forms part of The Queen's Green Canopy increasing the number of trees and restoring Britain's forests. I encourage everyone reading this to consider planting a tree this year not only to honour The Queen as the Head of the Commonwealth but also create a greener more positive future for our planet.

Through this Canopy, Commonwealth countries and territories have demonstrated their collective ability to work together to protect the world's forests. It also highlights the Commonwealth's network, its ability to share knowledge and best practice, underscoring its capacity to unite member states and territories towards common goals that benefit all of humanity. This meaningful step to end the scourge of global deforestation, will create a lasting legacy for Her Majesty The Queen and become a testament for cross-Commonwealth efforts to protect critical ecosystems and landscapes.

After the devastating global impact of the Coronavirus pandemic, the Commonwealth Heads of Government Meeting (CHOGM) this year is an opportunity for us to take the next big leap in the fight against global deforestation. I welcome the UK Government's recent announcement of a £100 million

Biodiverse Landscapes Fund which will aim to reduce poverty, protect, and restore biodiversity and lessen the impact of climate change in six environmentally critical landscapes across the globe, including the important KAZA region. It is vital that as Global Britain we support efforts to tackle deforestation both in the UK and throughout the Commonwealth.

Global deforestation is a crisis that affects us all. Its wide ranging, negative effects on biodiversity, climate change and environmental disasters cannot be understated. As leaders in our communities we must advocate for an end of unsustainable deforestation. We must urge our governments to work to remove unsustainable timber from our supply chains and agricultural products. We must also encourage companies to invest in projects that restore nature instead of destroying it. The CHOGM meeting in Kigali presents a rare opportunity to do just that. By supporting Nature Based Solutions and harnessing the vast expertise represented across the Commonwealth, leaders in

Kigali can show the world that the Commonwealth can lead in protecting the planet and future generations from environmental catastrophe.

**Hon. Theo Clarke, MP**

*The Parliamentarian*

*Hon. Theo Clarke, MP was elected as a Member of the UK Parliament for Stafford in 2019. She has a keen interest in foreign affairs, international development and global trade and amongst her many roles, she is the UK Prime Minister's Trade Envoy to Kenya, a member of the Women & Equalities Select Committee and the International Development Select Committee, and she is also the Chair of the Select Committee's subcommittee on the work of the Independent Commission for Aid Impact (ICAI). She is a member of the CPA UK Branch's Executive Committee. Previously, she was an entrepreneur and founded the Coalition for Global Prosperity.*

## Rubber is now the most important contributor to Europe's deforestation footprint in Africa's tropical forests

**A**nalysis of satellite imagery from across West and Central Africa reveals just how destructive industrial-scale rubber production can be. Europe's hunger for this commodity is speeding up global forest loss.

Shockingly, rubber is currently not included in the EU's draft legislation to protect global forests.

Even worse, we found out that the decision not to include rubber in the list of products to be regulated in Europe was made after the EU was lobbied by the tyre industry. The lobby group whose members include Michelin, Continental, Pirelli and Goodyear argued that mandatory sustainability standards were "not... feasible for the natural rubber value chain."

It's well known that European imports of palm oil, soy and beef are all-too-often linked to industrial-scale deforestation. In recognition of this, the EU Commission has drafted a law aimed at regulating these products to protect the world's forests.

Yet excluded from these planned regulations is the financial sector, whose money has proven vital in propping up environmentally destructive agribusiness companies. That includes the rubber industry.

We found that major EU banks provided over €1.5bn in financing to companies linked to forest-destroying rubber plantations in West and Central Africa.

Read the report at [www.globalwitness.org/en/campaigns/forests/rubbed-out/](https://www.globalwitness.org/en/campaigns/forests/rubbed-out/)

Furthermore, the EU's draft rules don't require companies to ensure that the rights of communities and Indigenous groups are respected. Our investigation uncovered evidence that the expansion of industrial rubber production in the region is fueling poverty and insecurity, and in some cases has forced Indigenous groups from their ancestral lands.

To protect the climate-critical forests of West and Central Africa, and the communities that depend on them, we're calling on MEPs and national governments to overrule powerful corporate interests and close the loopholes in the EU's proposed anti-deforestation law.

[www.globalwitness.org](https://www.globalwitness.org)

## Study suggests two million ancient and veteran trees in England – ten times as many as previously recorded

**A** new study has shown there could be around eight to ten times as many ancient and veteran trees in England than currently recorded, with estimates ranging from 1.7 to 2.1 million, compared to the 115,000 currently on record.

As many of these trees are yet to be recorded, most are not likely to be protected by conservation methods, policy or legislation, and therefore we don't know how many are at risk, why,

or where. New location mapping, developed by experts at the University of Nottingham, means work towards recording and mapping them could become easier.

The new research builds upon work carried out by the Woodland Trust, Ancient Tree Forum and the Tree Register, which has currently mapped 180,000 trees.

In this new study, published in *Ecological Applications*, experts from the School of Life Sciences at the University teamed





up with the Woodland Trust, to develop the first robust nation-wide estimate of ancient and veteran trees in England.

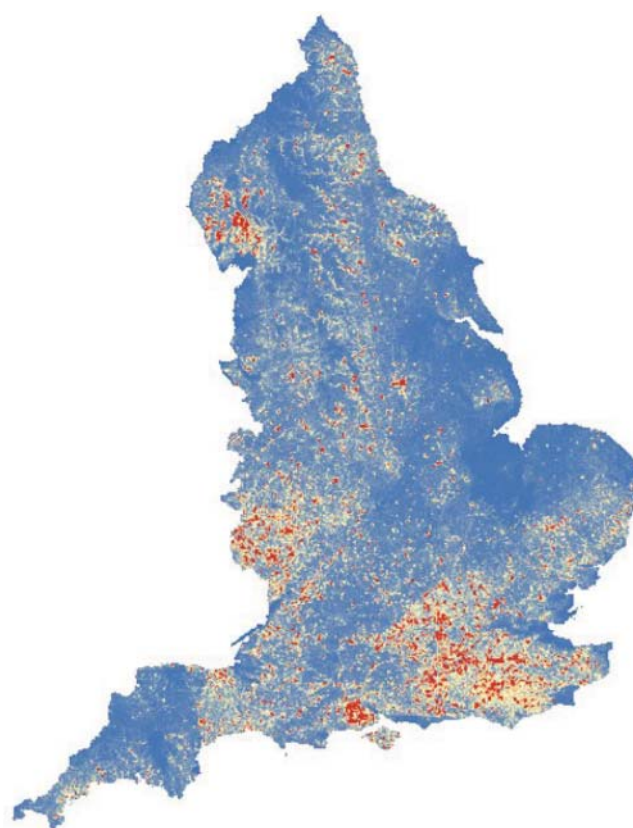
An ancient tree is a tree that shows exceptional age in relation to other trees of the same species. Most ancient and veteran trees display similar features such as a hollowing trunk, dead wood in the canopy or the presence of other organisms such as fungi or plants on its structure. They may also have irreplaceable historical or cultural value. Veteran trees share similar features and values to ancient trees, but they may not be old enough to be considered truly ancient for their species.

Birch trees for example, are fast-growing and could be classed as ancient at 150 years old, while a yew tree might receive the same accolade at 800 years of age. These trees are very important sources of dead wood that are valuable natural assets important for wildlife. They also have cultural and historical links, and some of the oldest trees in the country e.g. the Major Oak in Sherwood Forest, Nottinghamshire, are busy tourist spots.

Whilst an ancient tree may have legal protection if it provides a home to another protected species, the categorisation as an ancient or veteran tree does not actually provide protection alone, so identifying where these trees are is essential in order to set about increasing their protection.

Currently there is no legal protection for ancient or veteran trees unless they have a Tree Preservation Order, usually applied in emergency situations, or they are located within a legally protected wildlife site. Around 20% of ancient and veteran trees are located in sites like this so most ancient and veteran trees have no form of legal protection and policies need strengthening across the UK, for example to protect old trees in new developments.

The overall aim of the team's research was to create a distribution map to predict where hotspots of these trees might be, to help the Woodland Trust, and other recorders, to have a more targeted approach to surveys, saving time and resources. Using the Woodland Trust's Ancient Tree Inventory (ATI), the team created a number of different mathematical models, called species distribution models. The models used a variety of environmental, human and historical characteristics to predict the true distribution of ancient and veteran tree distribution across England.



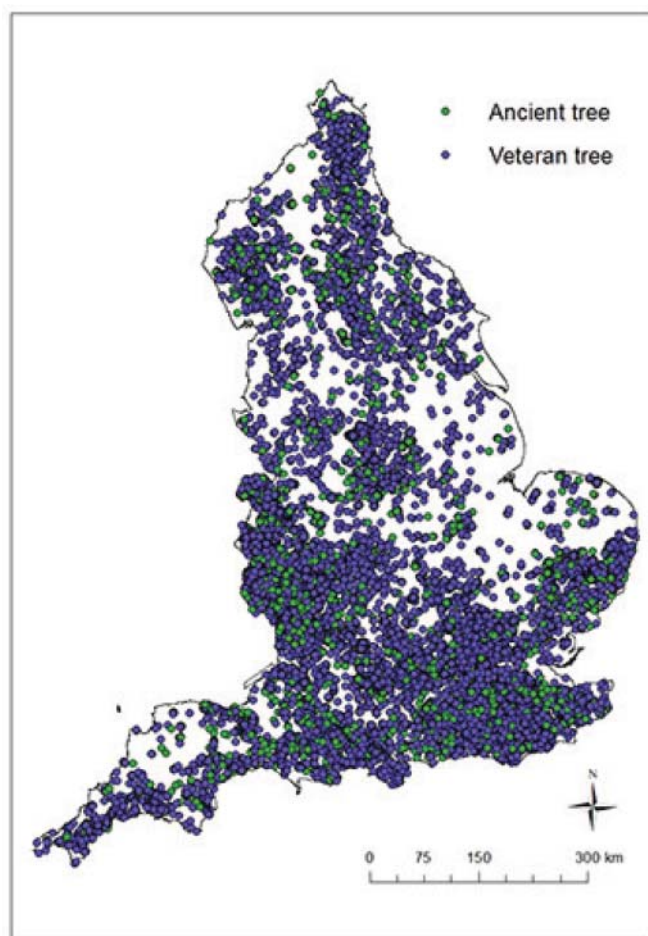
*Heat map of ancient trees in England*

The aim of the ATI is to identify and map the oldest trees in the UK, and was started in 2004. Anyone can record a tree online (<https://ati.woodlandtrust.org.uk>), with each entry then verified by experts.

Within the ATI there is likely to be what is known as 'sampling bias', where the actual distribution of records collected is partly a reflection of where people have gone to survey, rather than where the trees actually might be.

To combat sampling bias, some of the models used predictors such as distance from cities, distance from roads, and population density, as well as the environmental factors, to help

distinguish between places where people are unlikely to have looked for trees and places which really don't have any.



*Map of ancient veteran trees in England*

The aim was to select the best model that produced the map that was most reflective of the real tree distribution. In order to check the reliability of the maps, a group of volunteers was then recruited to carry out a selection of surveys to locate the trees.

Each volunteer was asked to survey one or more randomly selected 1km square grids as thoroughly as possible to find all the ancient and veteran trees in that square, with the results being used to help select the best model. Fifty-two square grids were surveyed in total covering 52 km<sup>2</sup> across England. A total of 459 trees were found, 94 of which were ancient and 365 of which were veteran.

Many volunteers also reported a high likelihood of more trees in areas that were inaccessible or too far off to survey

accurately. Therefore, these numbers are very likely to be under-estimates of the number of valuable ancient and veteran trees out there.

When cross-checked with the ATI, 285 of the trees found during these surveys were not previously recorded on the ATI, which means there was over a 100% increase in the number of trees known about across these squares. Many of these trees have now been added to the ATI, which will help the Woodland Trust to keep up-to-date with their condition and help to protect them if necessary.

Before the surveys only 15 squares had any records of ancient or veteran trees, but after the surveys that total rose to 38 squares (23 squares more).

A total of 22 species of trees were recorded across all the surveys, with Oak being by far the most commonly recorded (54% of identified trees), followed by Ash (12%), Beech (6%) and Sycamore (5%).

**The findings from the surveys provide an insight into the number of species and type of trees that are present in different areas of the country. They also were able to be used to calibrate the models and provide estimates of the total number of ancient and veteran trees across England.**

***Dr Victoria Nolan, researcher on the project***

She added: "Based on the best performing distribution models, these estimates predict two million ancient and veteran trees, which is an amazing increase on what is currently recorded. It also suggests there is a lot more recording to do, but by having these more accurate prediction maps, targeted surveying will make it much easier to find them!"

Adam Cormack, Head of Campaigning at the Woodland Trust said: "It's remarkable that this research suggests we are yet to find most of the UK's ancient trees, the cathedrals of the natural world. They're out there somewhere – hidden in field corners, woods, hedges, even gardens and parks. Volunteers have done an amazing job to map thousands so far and this research is the inspiration to redouble our efforts. It's like a map for buried treasure. But it's also worrying because these trees don't have the automatic legal protection that most of our wildlife and old buildings have. This is despite the fact some are more than 1,000 years old. These astonishing trees are our inheritance from history, and we should be treating them like national treasures. We are petitioning governments across the UK for better protection for our most ancient and important trees and to do more to support people who are looking after them."

**nottingham.ac.uk**

## The space tech helping to tackle deforestation

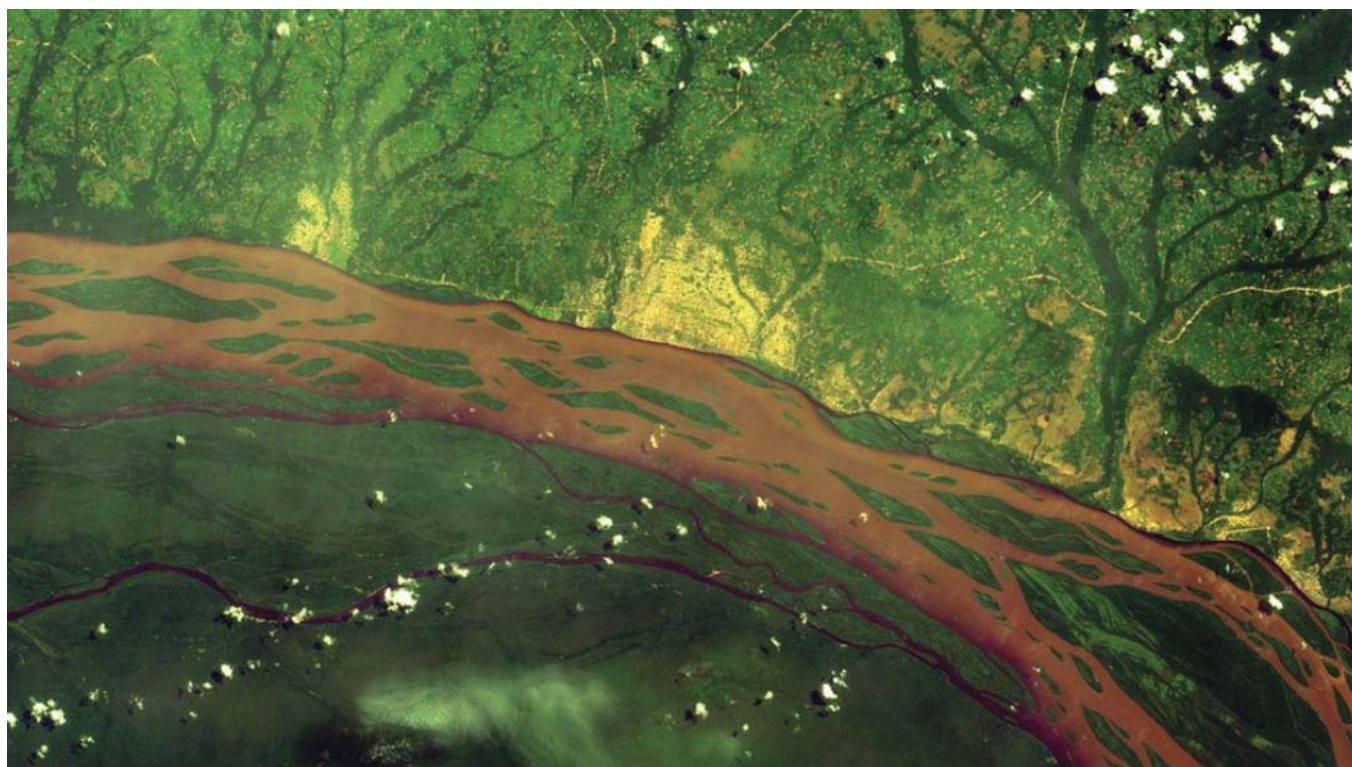
Conservationist, Leonidas Nzigiyimpa says "you can't manage what you don't know". He adds: "In order to improve the situation of forests, we need to use new technology."

Mr Nzigiyimpa is the chief warden of five protected forestry areas in the small central African country of Burundi. For the past two decades, he and his team have been working with local

communities to protect and manage the forest. His face lights up when he describes the fresh smell and beauty of the areas. "It's pure nature," he says.

In carrying out his work, Mr Nzigiyimpa has to consider a range of factors, from monitoring the impact of human actions and economies, to tracking biodiversity and the impact of climate change, plus staff numbers and budgets.





*The Congo river and surrounding forests*

To help him track and record all of this, he now uses the latest version of a free piece of software called the Integrated Management Effectiveness Tool. The tool was developed specifically for such environmental work by a project called Biopama (Biodiversity and Protected Areas Management Programme). This is supported by both the European Union and the 79 member state Organisation of African, Caribbean and Pacific States.

“So, we use this kind of tool to train the managers of the site to use it to collect good data, and to analyse this data, in order to take good decisions,” says Mr Nzigiympa.

Tracking and protecting the world’s forests is not just important for the local communities and economies most directly affected. Deforestation contributes to climate change so restoring forests could help combat it.

Some 10 million hectares (25 million acres) of the world’s forests are lost every year, according to the United Nations. This deforestation accounts for 20% of all the world’s carbon dioxide emissions, according to the World Wildlife Fund, which adds that “by reducing forest loss, we can reduce carbon emissions and fight climate change”.

To try to restore forests and other natural habitats around the world, the United Nations last year launched the UN Decade on Ecosystem Restoration. This has seen countries, companies and other organisations promise action towards preventing, halting and reversing the degradation of ecosystems worldwide.

“But just saying that we’re going to restore, it’s not enough,” says Yelena Finegold, forestry officer at the Food and Agricultural Organization (FAO) of the United Nations. “There’s the need for responsible planning of how that ecosystem restoration is going to happen, followed by actions on the ground enabled by investments in restoration, and monitoring systems in place to track that ecosystem restoration.”

This increased focus on managing forests has given rise to new digital tools to gather, sort and use data better. One of these

is the FAO’s own Framework for Ecosystem Monitoring (Ferm) website. The site was launched last year, and uses satellite imagery to highlight changes to forests around the world. The maps and data are accessible to any internet users, be they a scientist, government official, business, or member of the public.

A key data source for Ferm is US space agency Nasa, and its Global Ecosystem Dynamics Investigation system. Known as Gedi for short, this acronym is pronounced like the word Jedi from the Star Wars films. And continuing the theme of that movie series, its tagline is “may the forest be with you”. The tech itself is certainly very sci-fi turned real life. “We shoot laser beams at trees from the International Space Station,” says Laura Duncanson, who helps to lead the Gedi project from the University of Maryland’s Department of Geographical Sciences.

“We use the reflected energy to map forests in 3D, including their height, canopy density, and carbon content,” adds Dr Duncanson, who is a leading expert in remote sensing. “This is an exciting new technology because for decades we have been able to observe deforestation from space, but now with Gedi we can assign the carbon emissions associated with forest loss [for greater accuracy].”

Maps and data are also provided to Ferm by US business Planet, which operates more than 200 camera-equipped satellites. These take some 350 million photos of Earth’s surface on a daily basis, each covering an area of one sq km.

Planet can also be directly hired by governments and businesses around the world. In addition to monitoring forests, its cameras can be used to check everything from droughts to agriculture, energy and infrastructure projects, and monitoring key infrastructure, such as ports.

Remi D’Annunzio, a fellow FAO forestry officer, says that all the available imagery from space “has tremendously changed the way we monitor forests, because it has produced extremely repeatable observations and extremely frequent revisits of places”. He adds: “Basically, now, with all these publicly available satellites





*Nasa's Gedi system fires laser beams from the International Space Station*



*The Ferm website is accessible by everyone*



*Rangers in Vietnam are now using data from Ferm to tackle illegal logging*

combined, we can get a full snapshot of the Earth every four to five days.”

Examples of how all this near real-time monitoring via Ferm is now being used are pilot schemes in Vietnam and Laos that are trying to tackle illegal logging. Rangers and community workers on the ground are sent alerts to their mobile phones when new deforestation is spotted.

“Now, what we’re really trying to do is not just understand the volume of forests being lost, but where is it specifically being lost in this district or that, so that we can monitor loss, and even prevent it in near real-time, from getting worse,” says FAO forestry officer, Akiko Inoguchi.

**bbc.co.uk**

## Portrait of Mary Sutherland unveiled at Bangor University



*Dr Becky Heaton with the portrait of Mary Sutherland.*

Mary Sutherland (1893–1955) was the world’s first female Forestry graduate in 1916. She had a distinguished career in forestry in the UK and New Zealand and is one of the founding members of the New Zealand Institute of Forestry in 1927. A Mary Sutherland Memorial Redwood can be found in Whakarewarewa Forest.

Mary’s portrait is by the contemporary Welsh artist, Ceredigion-based Meinir Mathias.

Meinir said “I feel very honoured that it is the first portrait of a woman by a female artist commissioned to hang in the Council Chamber alongside artists such as Kyffin and Whistler. I was also really pleased to have a close look at the wonderful and inspiring mural by Edward Povey.”

Dr Becky Heaton unveiled the portrait during the day in which she received her honorary degree. Becky said, “Even 70

years after Mary Sutherland graduated, it’s not always easy being a woman in forestry – as I well know! I hope it is getting easier but can only imagine how hard it would have been for Mary, she had no role models. I want to pay tribute to her and to two female foresters, Dr Pat Denne and Dr Christine Cahalan from Bangor who were my role models and inspired me. I hope that Mary’s achievements continue to inspire female foresters today.”

Professor Oliver Turnbull, Deputy Vice-Chancellor, said, “We are proud to pay tribute to Mary Sutherland and Sir Robert Edwards, who made hugely significant contributions in their fields and had lasting impact on the world. These paintings, created by talented artists, will form a visual reminder of their pioneering work.”

**bangor.ac.uk**



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# Publications

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## Forest Sector Outlook Study, 2020–2040

FAO & UNECE

The *Forest Sector Outlook Study, 2020–2040* provides information for the UNECE region that supports decisionmaking by showing the possible medium- and long-term consequences of specific policy choices and structural changes, using scenario analyses whenever possible. The study is the first to cover the entire region and provides results for the main UNECE subregions of Europe, North America and the Russian Federation.

The study provides insight on six priority questions which were identified through a transparent and participatory process: (i) *How would different demand changes affect the UNECE forest products market?*; (ii) *How would different supply changes affect the UNECE region forest products markets?* (iii) *How would significant trade restrictions affect the UNECE region forest product markets?* (iv) *How will UNECE forests be affected by climate change?* (v) *How could UNECE region forests and the forest sector contribute to climate change mitigation?* (vi) *How could UNECE forests adapt to climate change?*

The study contains information on the possible impacts of future trends regarding the future forest carbon sink in tonnes



UNECE

### FOREST SECTOR OUTLOOK STUDY 2020-2040



of CO<sub>2</sub> equivalents, and on harvest, production, consumption, net exports and prices of wood products by 2040. The study takes a pragmatic, transparent and objective approach to answering these key questions, sometimes using a modelling approach. It enables stakeholders to evaluate the long-term consequences of policy choices.

The study contributes to evidence-based policy formulation and decision making. It is not a forecast of what will happen in the future. Rather, it sheds light on the possible consequences of policy choices and of factors external to the forest sector, most notably anthropogenic climate change. The study draws attention to the following issues emerging from the analysis in the study, and

asks questions which policy makers and stakeholders might consider: (i) *Disturbances and the forest sink*; (ii) *Demand for land for increased carbon sequestration by forests*; (iii) *Putting substitution in a wider context*; (iv) *Trade measures*, and; (v) *Need for a system-wide, holistic approach to strategies and policies*.

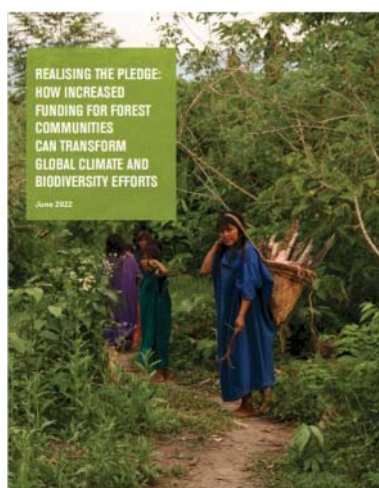
The report can be downloaded at [unece.org/info/Forests/pub/362308](https://unece.org/info/Forests/pub/362308)

## Realising the pledge: How increased funding for forest communities can transform global climate and biodiversity efforts

Rainforest Foundation

It has been more than six months since global leaders pledged USD1.7 billion at COP26 to scale up support for the land and resource rights of indigenous peoples and other local communities (IPLCs), in recognition of their vital role in protecting the natural world.

A new briefing by the Rainforest Foundations of the UK, US and Norway explores what it will take to mobilise this funding at the speed and scale necessary to address the



climate and biodiversity emergencies, while building the capacity of often remote and politically disenfranchised communities to absorb and use these funds.

Drawing on our 30-years experience of working with indigenous and other frontline organisations, **'Realising the Pledge'** calls for a reimagining of the funding architecture for forests and IPLCs, outlines the needed investments in capacity building and looks to the transformative solutions that can address the root causes of environmental destruction.



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# Around the World

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## Ukraine: Russia's invasion is putting the future of Ukraine's forests at risk

**T**he Russian invasion of Ukraine has sparked Europe's largest armed conflict since WWII and inflicted catastrophic damage on the continent's largest nation. In addition to the staggering human and economic toll of Putin's war, Ukraine is also facing an ecological crisis with the country's forests particularly at risk.

The most immediate wartime threat facing Ukraine's forests is posed by wildfires. Between the start of the Russian invasion on February 24 and the end of May, more than 160,000 hectares of Ukrainian forest burned down in regions affected by hostilities. With battle raging along a frontline stretching for more than a thousand miles across the country and Russian forces seeking to systematically destroy Ukraine's natural and industrial resource base, this grim trend looks set to continue.

There are also major war-related problems in forested areas that have already been liberated by the Ukrainian military. In late March and early April, Russian troops were forced to retreat from northern Ukraine following defeat in the Battle of Kyiv. As they withdrew across the border into Russia and Belarus, they left behind thousands of hectares of mined forests. It will likely be decades before these areas can be fully demined.

Other less immediate but equally serious threats to Ukraine's forests have emerged in recent months against the backdrop of the Russian invasion. The war has sent the Ukrainian economy into freefall, with the National Bank of Ukraine predicting a GDP drop of at least 33% in 2022 and possibly much more. Understandably, the authorities are seeking emergency measures to compensate for this economic collapse. Increased logging is being viewed as one potentially viable option.

The Head of Ukraine's State Forest Agency and the Minister of Environment have officially unveiled plans to increase the volume of felling. These efforts are set to focus primarily on logging in hard-to-reach mountains and wetlands. In other words, we could soon witness the destruction of Ukraine's most valuable remaining natural forests. Such plans may sound somewhat far-fetched, but they are actually part of the government's vision for Ukraine's economic recovery and were even presented at the Ukraine Recovery Conference, which took place in early July in the Swiss city of Lugano. The Ukrainian authorities also plan to attract foreign funding for forest development projects.

At this stage, it could still be argued that Ukraine's emergency logging initiative may not actually be implemented. However, a number of steps have already been taken since the outbreak of hostilities to ensure a future increase in felling volumes. Back in March, the Ukrainian parliament abolished a number of environmental restrictions on logging as part of wartime measures ostensibly introduced to enhance the country's defense capability.

The Ukrainian authorities have also made it more difficult for civil society to participate in efforts to monitor the environmental impact of logging. Access to previously public documents on felling has recently been closed or restricted. Meanwhile, a number of legislative acts that seek to further simplify the felling of older forests are currently being prepared. These and other steps have resulted in a 10–25% increase in felling volumes in recent months throughout Ukraine's western regions compared to the same period in 2021. Activists fear this increase is only the beginning.

Even before the Russian invasion, Ukraine's natural forests were shrinking and being replaced by plantations. The environmental, social and economic consequences of such unsustainable forest management are potentially disastrous and reach far beyond Ukraine. For example, the EU has clearly expressed the objective of conserving the Carpathians, but these efforts will be fruitless unless the Ukrainian part of the Carpathians is also protected.

What can be done to save Ukraine's forests? The most obvious solution is to bring the war to an end as quickly as possible. This can only be achieved with the support of the international community, which must impose tougher sanctions of Russia and provide Ukraine with enough weapons to defeat Putin's invaders on the battlefield. Anything less than a Ukrainian military victory will lead to a compromise peace which would merely set the stage for a new war in the years ahead.

Clearly, Russia's defeat cannot be achieved overnight. In the meantime, it is vital for Ukraine's partners to create incentives for the preservation of the country's forests. The Ukrainian authorities depend heavily on the international community for financial assistance to keep the economy afloat. Ukraine has also recently received official EU membership candidate status, which brings additional obligations as well as opportunities. With this in mind, Ukraine's international partners should look to incorporate conservation measures as a condition for continued support.

This would be very much in line with Ukraine's own European integration ambitions. In July 2022, more than 25 European NGOs appealed to the EU leadership with a list of specific steps needed to protect Ukrainian forests. Developed in the spirit of the European Green Deal, this list includes high-priority laws and other measures. It can become a road map for the Ukrainian authorities.

As Ukraine fights for survival and defends its right to a European future, it is vital to make sure the country's unique ecological inheritance is preserved and does not fall victim to Putin's invasion. European support can help prevent that from happening.

**atlanticcouncil.org**

## India: Tribals' existence key to survival of forests, animals

**S**ave tribals to save forests and animals, said Jharkhand Chief Minister Hemant Soren, kicking off a two-day festival to mark the International Day of the World's Indigenous Peoples, along with Rajya Sabha member and JMM supremo Shibu Soren here on Tuesday.

An array of programmes showcasing tribal art, culture, tradition and literature are lined up for the festival at Morabadi ground, besides panel discussions, seminars and fashion shows.

Speaking at the inaugural function, the chief minister said, "For tribals, their land, culture and language determine their identity. The new definition of 'development', which involves cutting down of forests to set up buildings and factories often threatens their existence.

"It's time we show them respect, cooperate with them. If we protect tribals and their interests, forests and animals will be saved too," he insisted. Soren also said that his government had been working tirelessly to "uplift" them.

"Getting a bank loan is a big challenge for tribals. Even when Hemant Soren goes to a bank for loans, he faces difficulties; he will be told his land comes under CNT (Chota Nagpur Tenancy) or SPT (Santhal Pargana Tenancy) Acts. We are trying to find a

way so that tribals get to avail loans easily," the chief minister asserted.

The JMM executive president, on the occasion, also said that a horde of schemes had been launched by his government to uplift the tribal population of the state.

"We have floated the Marang Gomke Jaipal Singh Munda Overseas Scholarship scheme in a bid to send tribal students abroad for higher studies. A Guruji Credit Card scheme will be launched soon for students willing to take loans to pursue education. Besides, work on setting up a tribal university is underway," he stated.

The CM announced that a tribal festival would henceforth be organised every year on August 9. "We demand the Centre declare August 9 as public holiday," he said.

The JMM founder, who was present at the event, gave assurance that the festival would be a grander affair next year. "Until all social forces work to increase the prestige of a society, we cannot talk about development. Such festivals will help in this regard," he added.

outlookindia.com

## Global: Scientists bring forests into the Internet of Things

**F**orests have a complex relationship with climate change. On the one hand, they absorb atmospheric carbon, even proliferating amid changing climates. On the other hand, they can suffer under higher heat stress, degrading their carbon sink capacity and drought resilience. With some \$10.5 million in funding from the German Research Foundation, scientists in Europe are now going to instrument forests with novel sensors to better understand how woodlands are affected by changing climate.

Mixing forest science with Internet of Things (IoT) technology, drones, and other devices, EcoSense will try to shed light on the effects of climate change on the interactions between plants, soil, and the atmosphere. These interactions vary according to species, location, and forest stand, which refers to collections of trees in a forest that are fairly uniform in their age, size, distribution, and other factors. The EcoSense initiative will bring new technologies to forest monitoring following efforts such as Harvard University's wired forest.

Specifically, the project will study abiotic and biotic processes of forest carbon and water exchange, how the ecosystem responds to environmental stressors, enabling the prediction of process-based changes in ecosystem function and sustainability, according to a project outline. Real-time sensor network data will be transferred to a database for analysis and deep learning simulation models to generate short- and medium-term predictions.

"Climate change has a huge impact on forest ecosystems already. We see an increase in tree mortality worldwide," said

Christiane Werner, a professor of ecosystem physiology at the Institute of Earth and Environmental Sciences at the University of Freiburg, pointing to the effects of the 2018 European drought on trees. "Currently, we have well-established models to predict overall ecosystem functioning under nonstressed conditions, but we do not understand when and why climate extremes like heat waves or droughts drive single trees or forest patches beyond their tipping points."

The research team will instrument several hilly hectares of the Black Forest in southwest Germany, covering stands of pure beech, pure spruce, and mixed trees. Climate-driven changes to the forest may have wider repercussions; the woodland is of economic and touristic importance to Germany, famed for its traditional farmhouses, cuckoo clocks, and eponymous ham and cake.

The EcoSense tool kit could include carbon dioxide (CO<sub>2</sub>) sensors, camera-equipped drones, and other devices. The team will initially deploy commercially available devices and then, from 2024, replace them with newly developed microsensors, some of which will be energy autonomous, according to Ulrike Wallrabe, a professor in the University of Freiburg's Department of Microsystems Engineering.

"We want to measure fluxes of water, isotope-discriminated CO<sub>2</sub> and volatile organic compounds and stress markers, mainly photosynthetic efficiency by chlorophyll fluorescence from soils up to atmosphere," said Wallrabe. "The sensor network will comprise new, compact and, wherever possible, energy autonomous sensors that are to be developed in the project."

Daniel Kneeshaw, a forest and climate change researcher at the University of Quebec in Montreal who is not affiliated with EcoSense, said the project is examining interesting parameters that should be useful to a wide variety of researchers.

“As the researchers suggest, what happens at a cellular scale when scaled up can have profound impacts across regions,” said Kneeshaw, adding he wants to know how EcoSense data will be scaled up and down. “Better understanding of the mechanisms will help us be better prepared for future changes. Having such networks around the world and getting scientists from the different networks to talk [about them] will lead to even more robust results and interpretations.”

The EcoSense project aims to begin publishing studies in 2023, but some groups affiliated with it have already started to release findings. For instance, one group including Werner published a paper on a wireless, autonomous chlorophyll fluorometer that measures photosynthesis efficiency in plants.

With a 10-kilometer range, the novel device can be attached anywhere on a tree and is low power and relatively inexpensive.

In addition to its initial 4-year funding, EcoSense has an option of two 4-year extensions to gain a long-term perspective. The researchers have high expectations of significant results.

“Our special feature is the unique alignment of ecosystem research with microsystems technology. Distributed autonomous sensing principals will open a new door for ecosystem research,” said Werner. “We will gain an unprecedented cross-scale coverage, both at the spatial level, from leaf to forest, as well as in a temporal dimension, from minutes to years, of processes and interactions driving carbon and water fluxes, including stress markers as volatile organic compounds and chlorophyll fluorescence.”

eos.org

## Finland: Over 100 cases of berry pickers getting lost in forests this summer

**P**olice across Finland have dealt with over 100 cases this summer where a person picking berries in a forest has become lost and is reported missing. The highest number of cases, 40, were reported in Lapland.

Risto Mertala, a senior constable at the Lapland Police Department, told Yle that a missing berry picker is typically discovered four to five hours after they are first reported missing. While the majority of people reported missing in Finland during the summer are berry pickers, Mertala noted, hikers and the elderly can also become lost in Finland's forests.

“Often the missing person is found within the same day,” Mertala said.

In many cases, the lost person will find themselves circling around, particularly if they are moving in dark or open terrain.

The general feeling of going in circles when lost is real, but the reason for this is not fully understood, according to Marja Hietanen, adjunct professor of neuropsychology at the Helsinki University Hospital. “The question is really interesting and there is no clear answer,” Hietanen said.

One hypothesis suggests that moving in a circle is connected to the human balance system. “It is believed that small errors in balance perception would accumulate while walking forward, leading to one going in circles,” Hietanen said.

yle.fi

## North America: Even a small rise in temperatures could decimate North American forests

**F**rom 2007 to 2017, land-based ecosystems like the vast boreal forests of Canada and the Amazon rainforest removed roughly a third of anthropogenic carbon emissions from the atmosphere. According to a slate of new scientific research published this week in *Nature*, however, the threats that climate change poses to these terrestrial carbon sinks are greater than previously understood.

A new study from a research team at the University of Michigan found that even a relatively small temperature increase of 1.6 degrees Celsius associated with climate change can have drastic effects on the dominant tree species in North American boreal forests, including reduced growth and increased mortality.

“Our results spell problems for the health and diversity of future regional forests,” University of Michigan forest ecologist Peter Reich, who led the study, told the University of Michigan news office.

This vast and nearly entirely intact boreal forest biome, stretching across the Canadian landmass and some of the

northern U.S., below tundra and above more temperate forest, consists primarily of coniferous spruce, pine, and fir species. The research team found that modest warming increased juvenile mortality in all nine tree species common in boreal forests, and that it also severely reduced growth in northern conifer species such as balsam fir, white spruce, and white pine.

While the study also found that increased warming boosted the growth of some broadleaf hardwood species like certain oaks and maples, which are more common in the temperate south, these trees are probably too sparse to take the place of disappearing conifers. The ecosystem is likely to enter an entirely “new state,” according to the study.

“That new state is, at best, likely to be a more impoverished version of our current forest,” Reich told the university news office. “At worst, it could include high levels of invasive woody shrubs, which are already common at the temperate-boreal border and are moving north quickly.”



The five-year experiment used infrared lamps and soil-heating cables to heat thousands of spruce, pine, and fir seedlings at two University of Michigan forest sites in northeastern Minnesota. Seedlings were heated around the clock in the open air, from early spring to late fall, at two different potential projections of near-term temperature increases.

Reich, who is the director of the Institute for Global Change Biology at the University of Michigan's School for Environment and Sustainability, elaborated that boreal forests may be reaching a tipping point at which even modest global warming creates a

feedback loop that not only reduces the ability of boreal forests to support healthy plant, microbial, and animal biodiversity, but also their ability to remove and store carbon.

Additional research published in *Nature* this week found that climate change is driving spruce trees into swaths of Arctic tundra that haven't hosted trees in thousands of years, and yet another study added to worries about the resilience of the Amazon rainforest to climate change.

[grist.org](https://grist.org)

## Zimbabwe: Big tobacco is sending forests up in smoke – what can small-scale farmers do?

Dressed in a thick brown jacket and wearing a traditional blue headwrap, 54-year-old Spiwe Juru sits on the floor sifting through tobacco leaves at her farm in Nyazura, in Zimbabwe's Manicaland province.

This is Juru's busiest day in winter as she sorts tobacco leaves based on their colour and quality, before taking the "golden leaf" for sale at the auction floors, a venue for tobacco trading, in the capital of Harare. For tobacco leaves to turn from green to yellow, small-scale farmer Juru uses firewood to burn them in homemade barns in a process known as curing, which removes moisture from tobacco using controlled temperatures over several weeks.

For every kilogram of tobacco, about 10 kg of wood is used in the curing process. "Each year I use firewood from the forests to cure tobacco," says Juru, with a glowing face. She has supported, clothed and fed six children with tobacco farming, and today sits in a makeshift grading shelter made of pole and dagga, with two helpers including her husband.

### The government's aim to grow the tobacco industry

Tobacco is one of the biggest foreign currency earners in Zimbabwe, alongside gold and money sent back from the diaspora. In 2021, it earned the country around \$1.2 billion (€1.17bn). The southern African nation, which is the largest producer of tobacco in Africa and the sixth biggest globally, is aiming to turn tobacco farming into a \$5 billion (€4.85bn) industry by 2025.

But this growing tobacco industry is sending Zimbabwe's forests up in smoke. Tobacco farming is responsible for ravaging 60,000 hectares of forests each year, show statistics from the Forestry Commission of Zimbabwe (FCZ), the state organisation tasked with the regulation, management and conservation of forests. That equates to around 20 percent of the country's total forest loss of 262,000 hectares per year.

Globally, around 3.5 million hectares of land are destroyed for tobacco cultivation every year. 90 percent of this land is in the developing world, where countries are prey to intensive tobacco industry interference and marketing tactics, according to a new report from the World Health Organisation.

The situation is spiralling despite Zimbabwe ratifying the United Nations Convention to Combat Desertification (UNCCD) in 1997. In 2005, the FCZ launched an initiative called Tobacco Wood Energy Programme (TWEP), working with smallholder farmers to establish woodlots for firewood that they can use to cure tobacco.

But to date deforestation from tobacco farming remains a huge problem.

### How do tobacco farmers fuel deforestation?

Zimbabwe's tobacco industry is dominated by smallholder farmers, as they contribute more than 50 percent of the country's yearly tobacco produce. Violet Makoto, a spokesperson for the FCZ, says the issue of tobacco farming in the country is troubling because it is being done in an unsustainable manner.

"We are looking at the amount of fuel wood that is required in the production of tobacco," she says. "That is causing a lot of deforestation in the country."

Makoto says approximately 85 percent of tobacco growers are smallholders, who use less than two hectares of land for growing the crop. This means they rely entirely on fuel wood for tobacco curing as their land is so small that they cannot grow trees to use instead.

"This is resulting in extensive deforestation," she says.

### Fast-growing trees are an alternative for tobacco farmers

Since 2015, tobacco farmers have had to pay a levy from their sales which are supposed to go towards reforestation. The levy is collected by the Tobacco Industry and Marketing Board (TIMB), channelled to the Reserve Bank of Zimbabwe and then distributed to the FCZ.

The Commission uses this fund to expand its nursery operations, propagating fast-growing species of trees which it gives to tobacco farmers. Makoto says the idea is to encourage farmers to set aside a piece of land for a woodlot of trees like eucalyptus, which can be used for tobacco curing.

The advantage with these fast-growing trees is that they are 'renewable' by nature, regenerating faster than indigenous trees which are slow-growing and harder to cultivate.

Chelesani Moyo, public affairs officer at TIMB, says tobacco growers are also encouraged to use barns that require less wood. "TIMB is doing awareness campaigns across all regions to curb deforestation," he says.

Moyo adds that TIMB is undertaking a project with the Sustainable Afforestation Association (SAA) to establish woodlots for all tobacco growers. To date, 150 hectares have been planted in Manicaland, with a similar coverage planned for the Mashonaland East and West provinces.

"Every tobacco grower is encouraged to establish a woodlot on their land. At least 0.3 hectares of wood per hectare of tobacco grown," he says. "Willing farmers get tree seedlings for free."

### **But farmers have little land on which to grow the trees**

The scheme suffers from being uneven, however. Laura Mlambo, monitoring and evaluation officer at Environment Africa, says a lack of enforcement means national programmes like 'tree planting day' are not being implemented throughout the country.

"Some farming areas are being left behind. Some farmers are smallholder farmers who do not have enough land to grow trees," she says. "They end up just cutting down trees without growing any."

Juru, who grew tobacco on a one-hectare piece of land in the last farming season, says she does not have an extra piece

of land to establish a woodlot where she can get firewood to cure the golden leaf.

Another small-scale farmer, Peter Notice says he uses timber and indigenous trees to cure tobacco. "I am on contract farming. So, as part of the company's support, they deliver timber for me to use. But at times I use indigenous trees," he says.

Until a truly fair and sustainable way is found to cure tobacco, the industry remains a major issue for stakeholders in the country and an ongoing threat to Zimbabwe's forests.

"If I can get something sustainable to cure tobacco, I am willing to try it," says Juru.

**euronews.com**

## **Togo battles to save its forests**

**E**very year Togo loses approximately five million trees according to the environment ministry. The government wants to put stop to the destruction and engage in a replanting programme.

In June the started a reforestation operation with the aim of planting 23 million seedlings by the end of 2022. The long term goal is to reach one billion trees by 2030.

"As per the government's roadmap, the ministry has decreed that one billion seedlings must be planted by 2030. We tell ourselves the government has heard our cries of distress, but it is not only reforesting that interests us at RVT (NGO Reboissons vite le Togo, ed). We want to learn how to do it, how to protect the forest, how to reach the goal", said Sebastien Balouki, executive director of the NGO "Reboissons vite le Togo" (RVT).

90% of households in Togo rely on firewood for cooking. One way to reduce consumption is through energy efficiency. As part of those efforts, authorities have embarked on a

campaign to promote improved stoves, locally-made cookers that are very economical in charcoal consumption.

The cookers are made using recycled galvanised sheet metal and ceramics.

"The use of these stoves contributes to the reduction of charcoal consumption. For example, if you use this stove with a small amount of charcoal, you can prepare a lot of things with it, and it also reduces cooking time compared to traditional stoves", claims Rodolphe Teko, manufacturer of improved stoves.

Local resident Rebecca Agbogla is happy with the results. "With this improved stove, we no longer use as much charcoal as before. Look, there are only three pieces of coal and water is boiling", she confirmed.

According to a report by the Mo Ibrahim Foundation published in 2022, nearly one billion Africans do not have access to a clean source of energy for cooking.

**africanews.com**

## **Global: Giant 'space brolly' to weigh Earth's forests**

**I**t looks for all the world like a giant brolly, but there's no rain where it's going.

An immense reflector-antenna is heading into space, to "weigh" Earth's forests.

It's a key component on the European Space Agency's Biomass mission, now under construction in the UK at aerospace manufacturer Airbus.

When unfurled, the space brolly's 12m by 15m wire-mesh membrane will be part of a very special P-band radar system. It's special because of its long wavelength.

At 70cm, it can look past the leaf canopy of forests to map the woody parts below – all those trunks and branches.

Using an approach akin to tomography, like that used in a CT scan, the 1.2-tonne satellite will analyse slices through the trees on repeat passes to build up a picture of how much woody material is present. Global maps should be produced every six months. The plan is for Biomass to gather at least five years' worth of data, to be able to spot trends.

Trees are a two-way valve in the climate system. They absorb copious amounts of the greenhouse gas carbon dioxide (CO<sub>2</sub>), but they also release it when they die or are burnt.

Precise numbers for the flows in either direction through this valve are elusive, however.

"This mission is about getting a much better handle on the role of forests, in either emitting carbon dioxide through destruction, or taking up carbon dioxide through growth," said Prof Shaun Quegan, the mission's principal scientist from the University of Sheffield. "At the moment, the amount that's being emitted from forests – the uncertainty on that number is 50% or a bit bigger, and I actually think 50% might be optimistic," the National Centre for Earth Observation (NCEO) researcher told BBC News.

Engineers from the American company L3Harris Technologies have been at Airbus in Stevenage to oversee the attachment of the antenna-reflector to the satellite's main body, or bus. Harris are experts in these large, unfurlable systems – knowhow which we don't currently possess in Europe.

The engineers executed a "pop and catch" test on Monday, to check the performance of the mechanism that will release the antenna and its 7m boom when the satellite arrives in orbit. "In space, pyrotechnics release a pin, and a motor then drives the system. The objective of this test is to ensure the antenna

clears the side of the spacecraft safely,” explained Airbus chief engineer Carl Warren.

It’s been a long journey for Biomass to get to this point. The science goes back to the late 1980s when an experimental P-band radar was flown over a forest in Eastern England to prove its credentials. But at that stage there was no prospect of such a system ever getting into space because the particular radar frequencies were reserved for military use. The US exploits the same band to watch for missiles approaching North America and Northern Europe. A case had to be made to the International Telecommunications Union to open up a small window in this sensitive part of the electromagnetic spectrum to enable a science application.

Even now, Biomass will not be permitted to operate over Western northern latitudes.

Prof Quegan is not unduly concerned about this restriction, though, because forest statistics in those regions of the globe

are already reasonably robust. The major zones of uncertainty are in the tropics and in Asia, where Biomass can wield its instrument without restriction.

The electronics for the radar instrument are currently sitting apart from the spacecraft in the Stevenage cleanroom. They’re hanging off a panel that is waiting to be attached to one side of the bus. “Once that’s done, Biomass will go to Airbus in Toulouse for testing,” said Vicki Lonnon, the Airbus quality assurance manager on the project. “The satellite will be shaken to simulate launch vibrations, and it will also go in a thermal vacuum chamber to simulate the conditions in space.”

Lift-off aboard a Vega rocket is expected towards the end of 2023. Biomass will map the Earth from an altitude of just over 660km.

**bbc.co.uk**

## Global: Why mature and old forests are so important for climate mitigation and adaptation

**T**he United Nation’s Intergovernmental Panel on Climate Change (IPCC) indicates that we must substantially reduce emissions from burning fossil fuels and simultaneously increase removal of carbon dioxide from the atmosphere by land and ocean reservoirs.

A recent executive order recognizes the importance of mature and old-growth forests in limiting climate change and makes their conservation a national policy. It also sets ambitious goals for the Forest Service and Bureau of Land Management (BLM), including “to conserve our mature and old-growth forests on Federal lands and restore the health and vibrancy of our Nation’s forests.”

Forests play an important role in mitigating climate change, with their carbon storage and accumulation in biomass that can serve as a carbon bank for decades to centuries. Forests are doing this now and require no development and scaling of technological solutions for removing carbon from the atmosphere – something that has already cost the nation billions with little progress. Although this may change with the \$430 billion in new tax credits, the timeframe for substantially reducing atmospheric carbon dioxide is 10 to 30 years to keep global temperature below 1.5 degrees Celsius, the threshold to avoid the worst impacts of climate change.

“Technology versus nature” should not be thought of as an either-or solution. We need both on the table, but we need to let forests do substantially more by protecting mature and old forests from logging, particularly on public lands where most of them exist and permanence is achievable. For example, harvesting forests accounts for the largest percentage of tree biomass mortality in the western U.S. compared with beetles and wild-fire. Protection of half the forestland in the region could triple the amount of biomass carbon that is currently protected, accounting for response to climate change.

The essential metric for climate mitigation by forests is the amount of carbon stored per acre in aboveground live and dead biomass, known as carbon density. It is determined by

measurements of diameter and height of each tree, something that is already measured on federal inventory plots.

Because mature and older forests accumulate and store the greatest amount of carbon over time, they could be defined as those with medium to high carbon per acre among stands of similar species composition within an ecoregion. Ecoregions are delineated on the basis of major soil and climate influences on ecosystem carbon processes.

Similarly, a benchmark such as medium to high amounts of critical habitat and species richness can be used to define mature and old forests that are high-priority areas to protect biodiversity. Ecoregion-based management ensures habitat and species are protected in each ecoregion, which would enhance resilience to climate change. This approach identifies priority mature and older stands to conserve for vital functions within each forest type and ecoregion.

The 13 agencies involved in the U.S. Global Change Research Program are charged with producing the first ever assessment report on the condition of nature in the United States. To do so will require updated measurements of plant and animal species richness and habitat quality in a measurement system that is co-located or coincides with the forest inventory. This is a much-needed activity to understand how climate change and disturbances are impacting species in forests at different developmental stages across the country, and to ensure that actions taken do not lead to species losses or impact the ability of species to move to new areas where they can survive and thrive under climate change.

These actions would address the executive order, “enlisting nature to address the climate crisis with comprehensive efforts to deploy nature-based solutions that reduce emissions and build resilience.” Importantly, it would pave a way to deliver on key commitments from the United Nations climate summit COP26.

**thehill.com**



## USA: 'Dry lightning' sparked the most destructive wildfires in California

Nearly half of the lightning strikes in northern California over the past three decades occurred on days with little to no rain, sparking some of the most destructive wildfires in the state's history

In central and northern California, nearly half of the lightning strikes over the past 34 years occurred on days with very little rain. Several of the days with the most widespread "dry lightning" in that period corresponded with three of the most destructive wildfires in California history.

A dry thunderstorm develops just like a normal one, with a warm updraft carrying moisture to higher altitudes where it forms clouds and lightning. But if the thunderclouds form on top of a layer of hot, dry air, rain might not make it to the ground along with the lightning. "You need to have a hotter, drier, lower atmosphere," says Dmitri Kalashnikov at Washington State University Vancouver. Dry lightning poses a special risk for wildfire because there is no rain to put out any fires started by the strikes.

Kalashnikov and his colleagues examined the meteorological conditions behind dry lightning in northern and central California, where nearly 30 per cent of the more than 5000 recorded fires since 1987 were started by lightning.

Using records of lightning strikes and precipitation in the region, which includes the fire-prone central and north coast and the forested Sierra Nevada, the researchers found that 46 per cent of lightning strikes occurred on days when there was less than 2.5 millimetres of rain – dry enough to be considered "dry lightning". The strikes were recorded between 1987 and

2020 by a network of ground-based sensors that detect radio waves emitted by lightning strikes.

They then looked at the meteorological conditions on days with dry lightning, as well the locations of dry lightning strikes to identify patterns specific to California. The study found dry lightning occurred most often between July and August, though it was most widespread in terms of geographical area from June to September, when wildfire risk is highest. The researchers found that dry lightning also occurred as late as October, says Kalashnikov.

The more detailed view of the meteorology behind dry lightning in California could help forecasters create early warnings for lightning-caused fires in the region, says Mike Flannigan at the University of Alberta in Canada. He says the same approach to studying dry lightning could be used in other places where it poses a growing risk, including Australia, Siberia and Canada.

Fires are becoming more severe and frequent as climate change leads to drier vegetation, and lightning might also become more frequent with warming.

Most fires in the US are started by people, but lightning can start more destructive fires. Lightning clusters can ignite many points at once, often in remote places where it takes longer for anyone to notice the blaze, says Flannigan.

California has a particularly fiery history with dry lightning – during the "Fire Siege of 1987", thousands of wildfires ignited by widespread dry lightning burned around 260,000 hectares. Wildfires started by dry lightning in 2020 burned nearly 1 million hectares.

newscientist.com

## Pakistan: Saving forests from fire to improve environment

Forest fire is an integral part of natural forests and is therefore an important subject of forest management. Recent forest fires in Pakistan, mostly in the subtropical mountain Chir pine zone in the lesser Himalaya, have generated a great deal of public debate and the irony is that the issue is politicised and blame game has started.

Forest fire occurs due to two main reasons. Firstly, hot and dry weather that causes forest ground biomass inflammability and secondly, the dropping of burning match stick, igniting fire for cooking, clearing forest biomass debris, burning grass or other vegetation by communities living in and around forests.

TikTokers, social media enthusiasts and youth are more often engaging in such activities for fun and leave behind burning wood or coal that spreads fire in the presence of increased quantity of inflammable biomass on the ground.

This year is extremely dry for a very long period of time and therefore, the forest biomass got dry to the extent that a slight fire turns into forest fire that spreads quickly.

The normal forest fire season in Pakistan, particularly in the Chir pine forest zone, is from March through June depending on

precipitation or the onset of monsoon. The biomass present on the ground gets too dry coupled with the presence of highly inflammable resin in the coniferous forests that catch fire easily. This is exactly what happened in the recent forest fires in Pakistan.

The chances of igniting forest fires have greatly increased as there is an increased road network and accessibility to forests, urban sprawl has turned forests into habitations, tourism and picnic trips have increased and youngsters and families love to go for outing, enjoy cooking and leave behind burning coal, etc in forests.

Local community also ignites fire at the grazing or agricultural land to burn all sorts of vegetation to collect ash as manure for the next grass or different crops and in this process the fire sometimes gets out of control and spreads.

Earlier, foresters and local communities stood together in not only preventing forest fires but also fought it in case of spread of the fire, but now gone are the days when the forest dwelling communities came for the protection of forests from fire, theft and illegal logging.

Foresters used to erect fire watch towers at the ridges, which were manned round the clock by the forest staff, who reported any visible smoke or fire for immediate control.

The forest department also used to hire aircraft for dropping awareness leaflets in the forest areas of Hazara, Swat and Dir, which I recall from my early days in forest service. Forest fire is part of the forestry manual, which provides pre- and post-fire control measures, but I don't think it is followed.

In view of the above exposition and the fact that forest fire is a reality, the blame game is baseless and conspiracy theories are spread by those who neither know the forest fire dynamics nor its causes and remedies.

We have failed to use social media or print or electronic media for awareness campaigns about forest fire and the role and responsibility of nature-loving citizens to save the natural

asset, which controls pollution, improves environment in the face of climate change, conserve water, reduces soil erosion and provides many other economic benefits.

Foresters are equally responsible as they have stopped short of following the old but effective fire control measures nor do they use any innovative methods and techniques.

The local community has also failed to take preemptive measures and help in controlling forest fire. This attitude of citizens, communities and foresters should change so that we stand together in controlling forest fire. We must play our part at individual, community and institutional levels as responsible citizens in protecting the natural asset.

**tribune.com.pk**

## Scotland: Cull of deer to begin in Scotland to protect forests and crops

**A** licensed cull of deer is to begin next week as part of the management of Scotland's deer population in order to protect woodland and crops.

Forestry and Land Scotland's (FLS) cull of female deer is being carried out as the annual economic impact of deer damage on FLS-managed land is estimated at £3m.

Figures show that deer numbers in Scotland have doubled from 500,000 in 1990, to more than a million currently. The September cull, which is also practised by other land managers, is being carried out following discussion with stakeholders.

Every year the FLS delivers one third of Scotland's overall annual deer cull in a bid to protect young trees and crops.

Deer management also contributes to Scotland's food and drink sector by providing venison for the UK and international markets.

Ian Fergusson, FLS' head of wildlife management, said: "Managing deer numbers helps to protect biodiversity projects and improve the overall health of the animals by reducing the risk of deaths from starvation in the winter months when food is scarce.

"Achieving these goals and creating the conditions that allow deer to continue to occupy their important place in Scotland's

biodiversity means keeping deer numbers in balance with the habitats that they occupy – and that is something that can only realistically be attained through culling."

Cull targets are set on the evidence of deer counts and surveys carried out by wildlife rangers and independent contractors throughout the year.

Anyone controlling deer in Scotland must do so in line with the Wild Deer Best Practice Guidance, which outlines how deer welfare is to be safeguarded when culling.

Donald Fraser, NatureScot head of wildlife management, said: "NatureScot can licence out-of-season control to prevent damage to woodlands and crops, covering the period from 1 September.

"Deer are an iconic species in Scotland and form an important part of our biodiversity, but their high numbers and lack of natural predators mean they have a negative impact by browsing on woodlands and other habitats.

"Sustainable deer management is vital if we are to bring populations in balance with nature and effectively tackle the twin crises of biodiversity loss and climate change."

**farminguk.com**

## Hungary eases logging in protected forests to tackle gas crunch

**H**ungary waived environmental regulations protecting native forests from logging, showing the increasingly extreme steps the government is willing to take to prepare for next winter's energy shortages.

The rise in energy prices after Russia's invasion of Ukraine have forced the government to partly scrap one of Prime Minister Viktor Orban's signature policies, the generous subsidies on household consumption. Hungary risks having shortages despite Orban's maintaining the closest links to Russian President Vladimir Putin among European Union members.

An emergency government decree published late Thursday eases the way for the clearcutting of native tree species – which include oak and beech – in protected forests, while also relaxing other restrictions on loggers. The government has also instructed

schools to check if they can switch to wood from gas for their heating.

The retail price of firewood climbed 18% in June compared to a year ago, according to the Hungarian statistics office. It's expected to rise further into the fall as households look for alternatives to expensive gas heating. The government banned exports of firewood last week to help maintain supply.

The latest relaxation of environmental rules will make Hungary more vulnerable to the effects of climate change without giving even a short-term boost to energy security, the World Wildlife Fund said in a statement.

**bnnbloomberg.ca**

## India: Tamil Nadu to get 10,000 mini-forests, says Minister

**M**inister for Environment and Climate Change Siva V. Meyyanathan said 10,000 mini-forests would come up in the State this year. Industries, including those under the red and orange categories, and even quarries would be roped in to plant these forests, he said.

Speaking at the inauguration of an International Conference on Sustainable Development in Hilly and Coastal Ecosystems at the M.S. Swaminathan Research Foundation (MSSRF) here, he said industries would have to plant saplings of native species about 12 feet in height. "If they do not have space inside their premises, then the Revenue Department officials can help identify land for them to plant and take care of the trees," he said.

He added that a bio-shield was to come up along 500 km of the State's coastline, where bamboo, palm trees, mangroves, neem and seaweed would be cultivated to mitigate issues due to climate change. The Minister, who inaugurated the MSSRF 'Every Child A Scientist' Centre (online) at Poompuhar, also released the foundation's annual report on the occasion.

Essam Yassin Mohammed, WorldFish interim director-general & CGIAR acting senior director of Aquatic Food Systems, Malaysia, in his keynote address, established the importance of keeping

aquatic creatures safe. "Many of us do not know that like trees, fish too act as a carbon sink. The more fish we have in the sea, the better it is for our environment."

He said that since we have done irreversible damage to the environment, there was a need to ensure livelihood opportunities for everyone.

Agricultural scientist Prof M.S. Swaminathan, in his video telecast, emphasised the need for conserving the genetic heritage and indigenous knowledge of tribal communities and reiterated that coastal and hilly restoration was essential for sustainable health. He said around 97% of water came from coastal areas, and therefore, mindful and sustainable usage of water resources was the key to future food security.

Madhura Swaminathan, Chairperson, MSSRF, said over the last three decades, the MSSRF had been working in the hilly regions of the Eastern and Western Ghats and in the coastal regions of India. It worked with tribal and rural communities to conserve biodiversity and natural resources and develop sustainable and scalable models for food and nutrition security, she added.

thehindu.com

## Global: As the climate crisis deepens, forests from the Arctic to the Amazon are changing

**A**s climate change decimates forests in places like Europe and North America, white spruces are showing up where trees haven't grown for a thousand years. According to a new study conducted in Alaska and published in the journal *Nature* on August 10, 2022, young white spruce trees are now growing in the tundra, where climate scientists did not expect them to be for another hundred years or more.

The white spruce trees in this study are *Picea glauca*, native to most of Canada and Alaska with limited populations in the northeastern United States. White spruce is the most valuable component of Alaska's interior boreal (taiga) forests that stretch from the Kenai Peninsula across the Alaska Range to the southern slopes of the Brooks Range including the drainages of the Yukon, Kuskokwim, and Copper River systems.

The climate crisis is not only changing global heating but the composition of soils in our forests, making it more difficult for trees to get the right nutrients and allowing them to become far less resilient to diseases. Added to the mix are the wildfires occurring around the globe as monster droughts make forests fire traps and dry up water supplies, reports *The Guardian*. "It's like humans have lit a match and we are now seeing the result of that," said Roman Dial, a biologist at Alaska Pacific University.

The study came about when biologist Roman Dial of Alaska Pacific University noticed the shadows of what appeared to be spruce trees while browsing satellite imagery of the Arctic tundra of northern Alaska. Dial and his colleagues had to hike for five days to see them. "It was shocking to see trees there. No one knew about them, but they were young and growing fast," Dial recounted, per the *Guardian*.

The group of researchers from Alaska Pacific University, University of Alaska Anchorage, Amherst College, and Northern

Arizona University, discovered that a patch of white spruce trees in northwest Alaska had "hopped" north into an area of the Arctic tundra that hasn't had such trees in millennia.

These new findings underscore new research published on August 11, 2022, that shows scientists underestimated the speed at which the Arctic is melting. It is warming up four times faster than the rest of the world, transforming ecosystems, upending migratory patterns of animals, releasing and redistributing carbon – and creating the environmental conditions for conifers to grow.

Dial and his associates estimate the spruce are advancing north at a rate of around 2.5 miles a year, aided by warming temperatures and changes to snow and wind patterns influenced by the shrinkage of sea ice in the region.

"It was shocking to see trees there. No one knew about them but they were young and growing fast," said Dial, who first spotted the shadows of the trees on satellite imagery and then took a single-engine plane journey, followed by a five-day hike, to find and study the advancing forest.

"The trees basically hopped over the mountains into the tundra. Going by climate models, this wasn't supposed to happen for a hundred years or more. And yet it's happening now."

It's also possible tree seedlings have taken root in other remote, inaccessible areas of the tundra that scientists have not yet discovered, the authors said, reports *Quartz*. There is a big downside to all this. As white spruce and others gradually migrate northward, they leave behind an increasingly barren biome, where dead trees invite wildfire and release additional carbon into the atmosphere.

digitaljournal.com



# Global: How renewable forests could solve a major electric vehicle problem

- While electric vehicles have the potential to drastically reduce global emissions, the batteries that these vehicles use have a very large carbon footprint.
- In an attempt to solve this major problem, two companies are working to develop a sustainable battery that uses an anode sourced from renewable wood.
- If successful, this would be the first industrialized battery using an anode made from lignin-based carbon – a renewable carbon source found in the cell walls of dry-land plants.

Automakers and energy companies are racing to find innovative options to boost electric vehicle (EV) battery technology as governments around the world attempt to curb the sale of diesel and petrol cars, increasing EV uptake. The latest experiment in this space is the use of wooden components in lithium-ion batteries, as companies invest in making their EVs greener.

Finish-Swedish firm Stora Enso and Volkswagen-backed Northvolt have partnered in the development of a sustainable battery that uses an anode manufactured from lignin-based hard carbon, which is sourced from renewable wood from Nordic forests. Through the Joint Development Agreement, the two companies hope to establish the first industrialized battery using the anode, made up wholly of European raw materials, reducing the battery's carbon footprint.

Johanna Hagelberg, Executive Vice President for Biomaterials at Stora Enso, stated of the project, "The joint battery development with Northvolt marks a step on our journey to serve the fast-growing battery market with renewable anode materials made from trees. Our lignin-based hard carbon, Lignode® by Stora Enso, will secure the strategic European supply of anode raw material, serving the sustainable battery needs for applications from mobility to stationary energy storage."

Each firm has specialist experience in battery production, which allows them to contribute effectively to the development. Stora Enso will deliver the lignin-based anode material Lignode, produced from wood from sustainable forests. Lignin, a renewable carbon source, is a plant-derived polymer that comes from the cell walls of dry-land plants, with trees made up of between 20 and 30 percent of the material. Enso already has a pilot plant it uses for its bio-based carbon materials in Finland, producing around 50,000 tonnes of lignin per year. It is now studying the potential for the industrial production of Lignode.

Meanwhile, Northvolt will develop the cell design and production process and will scale up the technology for commercial production. Northvolt, established in 2016, is a European supplier of battery cells and systems. It has so far attracted \$55 billion in funding from companies such as including BMW, Fluence, Scania, Volkswagen, Volvo Cars, and Polestar to develop a low-carbon lithium-ion battery for use in EVs. The firm is also

developing its battery recycling capabilities with the aim of sourcing 50 percent of the raw materials for new batteries from existing batteries by the end of the decade.

Emma Nehrenheim, Chief Environmental Officer at Northvolt, explains, "With this partnership, we are exploring a new source of sustainable raw material and expanding the European battery value chain, while also developing a less expensive battery chemistry. It is an exciting demonstration of how our pursuit of a sustainable battery industry goes hand-in-hand with creating a positive impact both on society and cost."

Automakers and energy firms are finding it increasingly difficult to source battery components partly due to delays in the global supply chain following the Covid-19 pandemic, but mainly owing to the lack of mining projects in operation, required to provide the metals and minerals needed to produce batteries. The International Energy Agency explained in May that there is a "shift from a fuel-intensive to a material-intensive energy system", about the need for more widespread mining operations to meet the global demand for materials needed for renewable energy projects.

With several governments aiming to phase out the sale of new petrol and diesel vehicles starting at the end of the decade, automakers are competing to develop the best and most cost-effective EV models as uptake in Europe, North America, and Asia rapidly increases. In June, the E.U. made the decision to ban the sale of internal combustion engine (ICE) cars and SUVs by 2035, making it the first whole region to do so.

But the successful banning of ICE cars will require a huge investment in battery research, development, and production, as well as the global scaling up of mining operations. The decision to prohibit petrol and diesel vehicles comes as part of the aim of many governments worldwide to reduce their carbon emissions to achieve net zero by 2050, in line with Paris Agreement targets. However, shifting reliance from one natural resource to another may put other materials under threat. However, projects such as the wooden anode could provide an alternative, more sustainable solution to battery development. If new renewable components can be developed for battery production, it would reduce the reliance on mineral mining which could cause widespread environmental degradation.

As automakers and energy firms race to develop the most innovative and efficient lithium-ion batteries, for use in EVs and several other products, companies are now looking for alternative materials to produce these batteries. If companies are successful in finding an alternative to intensive mining for natural resources in their battery development, it could provide them with the competitive edge needed to make their products stand out for being more sustainable.

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