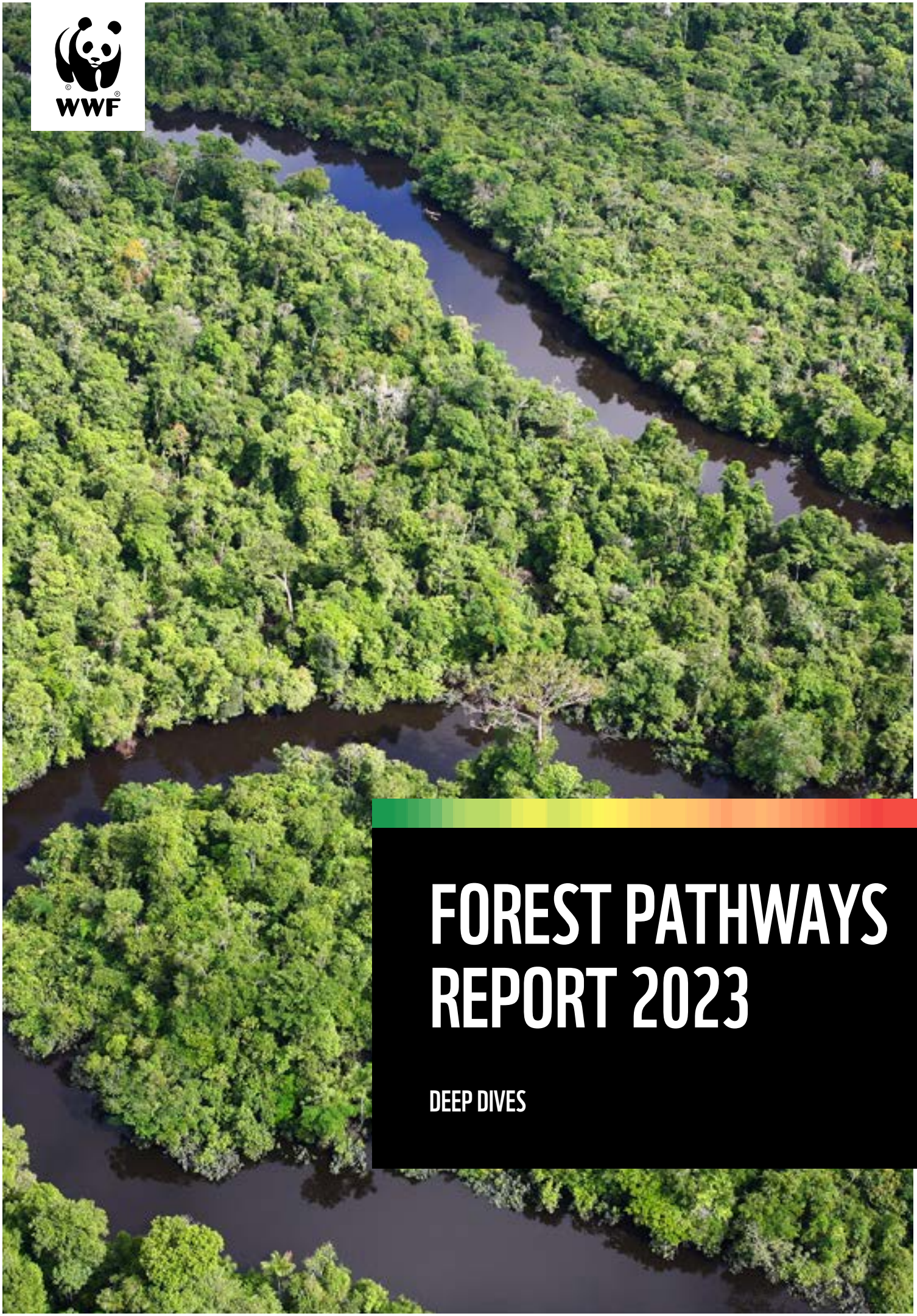


FOREST PATHWAYS REPORT 2023

DEEP DIVES

Lead Authors

Dr Mary Gagen, WWF-UK and Swansea University. Nigel Dudley, Equilibrium Research. Dr Steve Jennings, Alauda Consulting Ltd. Hannah L. Timmins, Equilibrium Research. William Baldwin-Cantello, WWF-UK. Laura D'Arcy, WWF-UK. John Dodsworth, WWF-UK. Damian Fleming, WWF International. Hermine Kleymann, WWF International. Pablo Pacheco, WWF-US. Fran Price, WWF International.

Contributing Authors

Claudia Amicone, Fundacion Vida Silvestre Argentina. Irfan Bakhtiar, WWF-Indonesia. Osvaldo Barassi Gajardo, WWF-Brazil. Charlotte Benham, ZSL. Dr Ananta Ram Bhandari, WWF-Nepal. Ivaneide Bandeira Cardozo, Kanindé Ethno-Environmental Defense Association. Gijs Breukink, WWF-Netherlands. Colman O Criodain, WWF International. Tim Cronin, WWF-Australia. Cleo Cunningham, BirdLife International. Michael Davis, WWF-Australia. Damary Elage, Kanindé Ethno-Environmental Defense Association. Karen Ellis, WWF-UK. Cristina Eghenter, WWF International. Mariana Ferreira, WWF-Brazil. Rory Francis, WWF-Cymru. Shaun Hurrell, WWF-Sweden. Zhonghao Jin, WWF-China. Jean-Paul Obame Engone, WWF-Gabon. Israel Correa do Vale Junior, Kanindé Ethno-Environmental Defense Association. Lucía Lazzari, Fundacion Vida Silvestre Argentina. John Lotspeich, Trillion Trees. Liliana Lozano, WWF International. Tracey Lue, WWF-Canada. Robin McGhee, WWF- UK. Louise McRae, ZSL. Carmen Monges WWF-Paraguay. Taruhim M.C. Quadros, WWF-Brazil. Tim Rayden, WCS. Veronica Robledo, WWF-UK. Oscar Rodas, WWF-Paraguay. Lucia Ruiz, WWF-US. Felipe Spina Avino, WWF-Brazil. Meg Symington, WWF-US. Victória Varela, WWF-Brazil. Daniel Venturi, WWF-Brazil. Bitate Uru Eu Wau Wau, Kanindé Ethno-Environmental Defense Association.

Advice and Review

Mike Barrett, WWF-UK. James Brampton, WWF-Greater Mekong. Nicola Brennan, WWF-UK. Luca Chinotti, WWF International. Jane Crabb, WWF-UK. Zhou Fei, WWF-China. Akiva Fishman WWF-US. Huma Khan, WWF International. Margaret Kinnaird, WWF International. Tomasz Pezold Knezevic WWF-CEE. Yeqing Li, WWF-China. Karen Luz, WWF International. Paul de Ornallas, WWF-UK. Per Larsson, WWF-Sweden. Neha Sinha, WWF-India. Jean Timmers, WWF-Brazil. Analiz Vergara Herdoiza, WWF-US. Rachel Wilson, WWF-UK. Brittany Williams, WWF-US. Mark Wright, WWF-UK. Lucy Young, WWF-UK. Yu Xin, WWF-China.

Editing and Design

Jonathan Gledson (www.millerdesign.co.uk): Infographics.

Evan Jeffries (swim2birds.co.uk): Copy editing and proofreading.

Matt Wood (madenoise.com): Design.

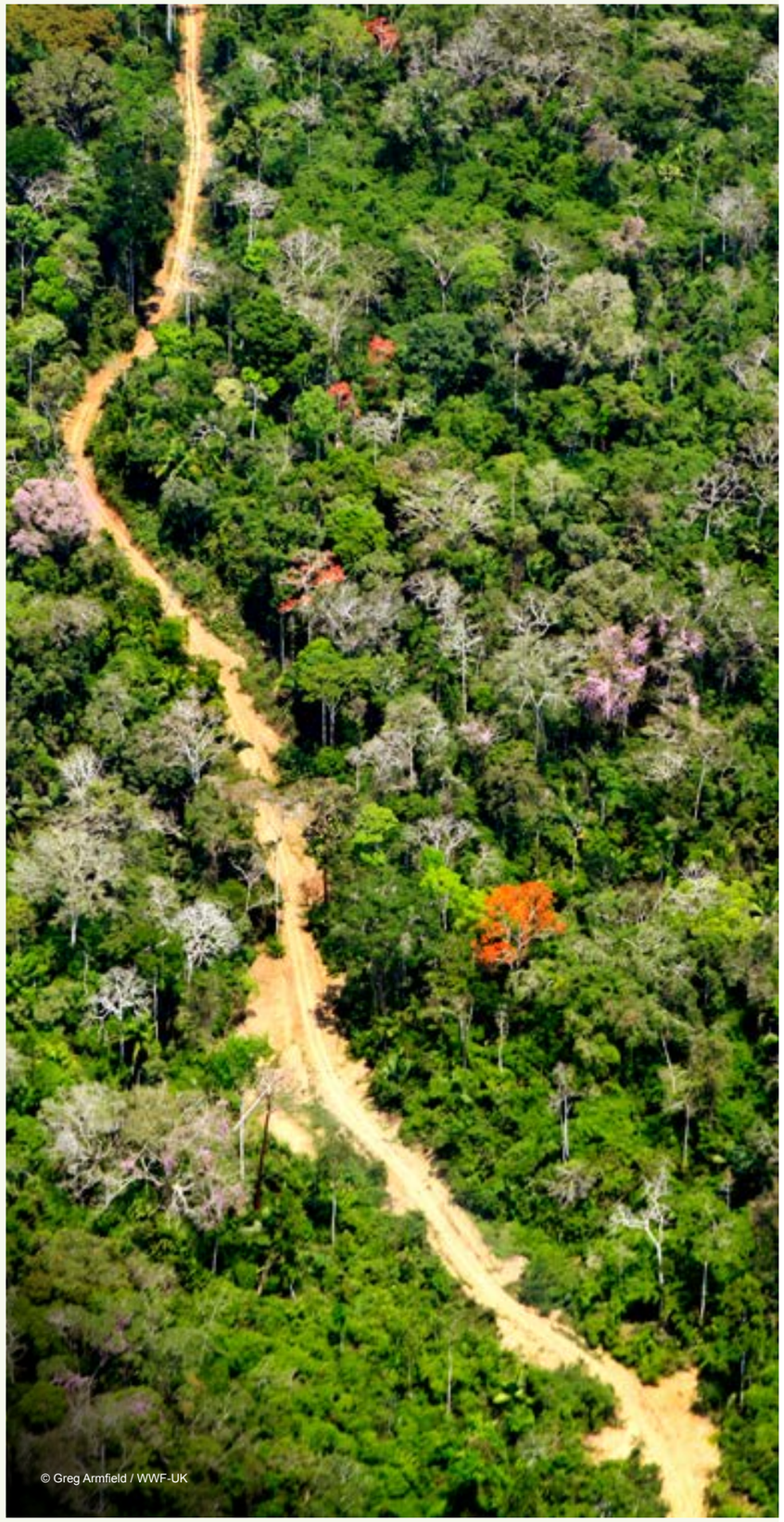
Sam Pollard, WWF-UK: Forest Stripes. In collaboration with the University of Reading, and University of Derby. showyourstripes.info

With grateful thanks to:

Richard Betts. Jon Drori. David Edwards. Ed Hawkins. Miles Richardson. The Forest Declaration Assessment Partners.

How to cite this report: WWF (2023) The Forest Pathways Report. Gagen, M.H., Dudley, N., Jennings, S., Timmins, H.L. Baldwin-Cantello, W., D'Arcy, L., Dodsworth, J.E., Fleming, D., Kleymann, H., Pacheco, P., Price, F., (Lead Authors). WWF, Gland, Switzerland.

Facts correct as of October 18th 2023 and for Forest Declaration Assessment 2023 draft of that date.



Cover photography: Aerial shot of the Amazon, Loreto region, Peru.
© Brent Stirton / Getty Images

The Forest Stripes, livingplanetindex.org/fsi. Population abundance of species that rely on forests, 79% average decline 1970 to 2018. The Forest Specialists Index measures the change in average population abundance of monitored species which strongly depend on forest habitats. The image shows the change in the index between 1970 and 2018, which gives an average decline in relative abundance of 79%, from 1,428 forest specialist populations monitored in 346 species. The Forest Stripes are a collaboration between WWF, the University of Reading, University of Derby and ZSL, the Zoological Society of London, part of the wider Climate Stripes family (biodiversitystripes.info / showyourstripes.info)

CONTENTS

DEEP DIVES

DEEP DIVE

Guardians of the land: Indigenous Peoples and forest governance

LILIANA LOZANO FLORES, WWF INTERNATIONAL,
CRISTINA EGHENTER, WWF INTERNATIONAL,
TRACEY LUE, WWF-CANADA

"Only by recognizing the rights, knowledge, innovations, and values of Indigenous Peoples and local communities will we be able to push forward the global agenda to sustainably use and conserve biodiversity."

LAKPA NURI SHERPA, INDIGENOUS REPRESENTATIVE FROM NEPAL. DECEMBER 2022. COP15.

INTRODUCTION

Indigenous Peoples (IPs) and local communities are vital custodians of the world's remaining natural landscapes, with at least 15.5% (5.11 million km²) of the total forest area formally and traditionally governed by them (data from 52 countries representing 90% of the global forest area).[1] Globally, there is growing recognition of the important roles and contributions of IPs as custodians of biodiversity as well as partners in the conservation, restoration and sustainable use agenda. Appropriate recognition of, and support for, the rights of IPs over land and resources, and engaging them as partners and rights-holders rather than beneficiaries, is critical for reaching globally ambitious forest goals. We must further invest in advocating for recognition of the collective rights of IPs, supporting self-governance systems, enhancing the revival and intergenerational transmission of traditional and local ecological knowledge, and fostering appropriate social and cultural management practices based on traditional knowledge systems.


© Marizilda Cruppe / WWF-UK

WHY ARE INDIGENOUS PEOPLES CRITICAL ACTORS IN EFFECTIVE AND EQUITABLE FOREST GOVERNANCE?

Research drawing on data from 64 countries comprising 82% of global land area shows that IPs and local communities own or govern, either through legal or customarily-held tenure, approximately 18% of the total; but only 10% has been formally recognized.[2] Their lands are in good ecological condition,[3] and intersect 40% of all terrestrial protected areas and ecologically intact landscapes.[4] IPs hold an intimate connection to their lands and waters and accumulated knowledge on the conservation of their territories. Traditional Indigenous territories coincide with areas that encompass 80% of the world's biodiversity,[5] providing global environmental functions and services.[6] Furthermore, IPs have contributed to mitigation strategies related to resource management and forest monitoring;[7] their lands contain at least a quarter of carbon stored above ground in global tropical forests.[8] They have also been proven to hold knowledge and capacity that often gives them a greater ability to respond and adapt to environmental threats more swiftly than centralized state responses. Finally, in addition to ecological and cultural contributions, studies in the Amazon biome have shown that Indigenous forest management strategies have made proven contributions to the local and national economy in terms of carbon sequestration, pollution reduction and sustainable use of resources.[9]

IPs have developed a diversity of management practices that have allowed them to keep the flow of forest resources and ecological services together with ensuring the provision of their livelihoods.[10] These management practices rely on traditional ecological knowledge that can include temporal restriction or total protection of certain species, protection of specific habitats due to cultural or ecological value, resource rotation, monitoring of forest resources and habitat, and watershed management.[11] Furthermore, management practices are supported by self-governance systems which enable Indigenous groups for self-organization, institutional learning and innovation that allow them to adapt and overcome the multiple socio-environmental challenges they face.

DRIVERS AND CHALLENGES THREATENING INDIGENOUS TERRITORIES

Multiple land-use drivers threaten Indigenous territories including mining, land conversion for agriculture and livestock rearing, infrastructure development, and illegal logging. A recent study shows that over a quarter of IPs lands could face pressure in the future if commodity-driven development increases; this could be exacerbated if it is combined with a lack of formalized rights and poorly applied Free, Prior and Informed Consent (FPIC) processes.[12] Tenure insecurity further undermines the sustainability and future of their territories and forests, while persistent structural and cultural challenges – linked to the primacy of colonial values over Indigenous vision and the perception of IPs as a homogeneous group – hamper the full inclusion of IPs in forest governance.

Multiple institutional responses to the diverse and interrelated threats and challenges have been developed, both by IPs and state institutions. These have included old and new models linked to state-led conservation (e.g. creation and expansion of protected areas); community-based conservation such as the integrated conservation and development projects (ICDP); co-management schemes; and, recently, market-based mechanisms such as payment for ecosystem services.[13] However, these tools have not always been fully successful, and in some cases they have brought major problems. For instance, the setting of protected area systems such as the ARPA system in Brazil has shown success in conservation outcomes[14]. Simultaneously, in some cases, the establishment of protected areas has also been linked to processes of land dispossession and less access to forest resources increasing the risk of livelihood provision to local communities[15].

More recent developments have included rights-based approaches such as the recognition of rights to ancestral lands and territories, governance systems, and sustainable economies.[16] Such approaches recognize that IPs play an outsized role in conservation through their worldviews, cultures and ways of life,[17] despite often receiving little to no formal recognition or support. The full inclusion and recognition of IPs not only makes conservation more equitable, but makes it more successful in terms of effective biodiversity and conservation outcomes.[18]

RECOMMENDATIONS AND WAYS FORWARD

International policy and corporate funding supporting Indigenous initiatives has not been enough to halt deforestation and conversion within Indigenous territories. We also highlight that policies considering the whole range of ecosystems critical for culture, livelihood and territorial claims is a key recurrent ask from Indigenous Peoples and local communities[19].

We ask for strengthening of the governance rights of IPs to protect their lands as well as critical policy developments that include:

For the governments

- *Recognizing IPs as rights-holders, and as leaders and partners in addressing climate crisis and biodiversity loss*. This implies recognizing their territories, rights and self-organization, as well as their leadership role, distancing from only considering them as collaborative stakeholders or participants, especially when it refers to decision-making process over their territories.
- *Ensuring that financial and technical resources are directly accessible to Indigenous groups to support their stewardship of forest and natural ecosystem lands,* which requires:
  - Recognizing IPs as rights-holders and partners for effective collaboration.
  - Using human rights-based approaches (HBRA) at all times (self-determination, participation, access, get benefits, socio-cultural diversity).
  - Consultation, participation, FPIC, inclusivity, transparency, culturally-tailored, and coherent donor support.
  - Taking into account the heterogeneous groups and contexts.
  - Transformational and holistic support, moving from only a "technical" view.

For conservation NGOs

- *Respecting Indigenous rights and supporting Indigenous communities in leading forest and ecosystem stewardship.*
- *Policy advocacy at national and subnational scale to influence national laws and policies on the recognition of Indigenous and traditional territories, their management practices and self-governance systems*. This implies providing adequate space for a dialogue in which Indigenous values, perspectives and priorities are listened and attended to.
- *Support the strengthening of self-governance systems to empower Indigenous institutions*. This entails strengthening the community actors and the social mechanisms that allow the functioning and sustainability of the Indigenous institutions. For instance, getting recognition as an Indigenous community; accessing rights to land and resources; putting in place mechanisms for preserving and ensuring the intergenerational transmission of the rich cultural diversity; running a comprehensive conservation approach that combines Indigenous and western knowledge systems; and strengthening youth and women's role in conservation.
- *Strengthening governance for resource management to empower Indigenous forest stewardship*. This entails running locally-led resource management practices in harmony with Indigenous traditional systems and specific ecosystems. For instance, implementing community-based subsistence strategies that rely on local production; enhancing Indigenous entrepreneurship; developing community-based monitoring strategies that combine both technological and traditional knowledge.

DEEP DIVE

Indigenous Peoples and forest management

IPs inhabit – either under legal agreements or through less formal and often insecure traditional governance arrangements[20] – many of the world's remaining areas of high biodiversity, particularly tropical and boreal forests. Research drawing on publicly available geospatial resources found that IPs manage or have tenure rights over at least ~38 million km^2 [21]in 87 countries or politically distinct areas on all inhabited continents. This is over a quarter of the world's land surface and intersects with about 40% of all terrestrial protected areas and ecologically intact landscapes (for example, boreal and tropical primary forests, savannas and marshes).[22] Research also suggests that at least a third of so-called Intact Forest Landscapes exist on Indigenous territories, probably more.[23] IPs therefore play a critical role in global biodiversity conservation strategies and in the future of these landscapes.

Biodiversity in Indigenous territories. There is good evidence from multiple sources that management of traditional territories by IPs is at least as effective – sometimes more effective – in retaining natural vegetation cover than alternatives, including many state-run protected areas.[24,25,26] This success, however, has been linked to secure land tenure in forest and ecosystem areas, a clear enabling condition.[27] Across the tropics Indigenous territories have a fifth less deforestation, conversion and degradation.[28] There is good information on the role of sacred natural sites in conserving aspects of biodiversity,[29] and some slightly more anecdotal or partial evidence of successful conservation from ICCAs and other forms of community management.[30,31,32] The site- and context-specific factors that enable the link between Indigenous territories and better outcomes for both IPs and their territories and for broader forest goals are poorly understood in detail and an area in which greater evidence is needed to inform policy.

IPs' representatives have been active in international conservation institutions, particularly the CBD, and have also increasingly been recognized for their conservation efforts on the ground. For example, in Canada, First Nations groups are protecting the Great Bear Rainforest,[33] containing a quarter of the world's remaining coastal temperate rainforests, an estimated 20% of the world's remaining wild salmon[34] and territories of 27 coastal First Nations.[35] Key success factors were use of ecosystem-based management (EBM) promoting human well-being and ecology, a strengthening of First Nations rights, land-use planning, development of enabling legislation and engaging key stakeholders and First Nations. The project brought consensus to protect 8.5 million hectares of coastal BC temperate rainforest,[36] supported local economic development and ended decades of conflict.

Pathways to fairer recognition of rights and roles. The CBD's Global Biodiversity Framework gives more explicit attention to IPs' rights and roles than previous agreements such as the Aichi targets, including the unresolved issue of how to ensure that Indigenous territories count towards the 30x30 target, whether incorporated within the existing PA and OECM frameworks or through some alternative means.[37] The GBF final statement wording was ambiguous, and it is important that this ambiguity does not pass into implementation. Given the evidence that Indigenous territories are critical to sustainable forest management and protection they must be included in the GBF's 30X30 target. Inclusion of Indigenous territories more widely in area-based conservation has many implications, including greater expectations for monitoring and adaptive management, and the need to react to changing climatic conditions.[38] At the same time, many Indigenous territories remain under pressure[39]and the need for adequate rights-based protection from threats is growing all the time.

The new opportunities presented by the GBF also carry some risks. Under implementation it is vital that governments do not simply hand over target-based responsibility for management of large land areas to IPs without adequate support, which would risk IPs being unable to defend their territories against outside pressures. IP partnerships should be fostered with government departments, NGOs and, where appropriate, with traders and businesses who are committed to rights-based and conversion and degradation-free commodities practices and sustainable forest management. Expanding funding and ensuring it reaches the people on the ground is an important priority.


© Luis Barreto / WWF-UK

DEEP DIVE

Repurposing harmful agricultural subsidies to curb forest loss

HERMINE KLEYMANN,
WWF INTERNATIONAL

THE GLOBAL AGENDA ON REPURPOSING SUBSIDIES

Repurposing environmentally harmful subsidies is high up on the global agenda. Global alliances, including non-state actors and business coalitions, are calling for reform and repurposing of subsidies to achieve more sustainable food systems while embracing a just rural transition, and a nature-positive and net-zero economy.[40] Given that about a quarter of global emissions are associated with food production, and half of this is linked to land-use change,[41] repurposing subsidies may have a significant impact on climate mitigation. Moreover, target 18 of the new Kunming-Montreal Global Biodiversity Framework (K-M GBF), adopted in 2022 by 196 member governments, calls upon governments to identify (by 2025) and eliminate, phase out or reform harmful subsidies by 2030 in a "just, effective, and equitable manner". In addition, the G7 in 2022 committed to "redirect or eliminate incentives including subsidies harmful to biodiversity by 2030 at the latest".

An estimated **US$378 billion** to **US$1 Trillion** ([42,43] and section 1.3 of this report) of potentially environmentally harmful subsidies are spent in the agricultural sector each year, including crop commodities responsible for driving forest loss and conversion of other natural ecosystems. This also has impacts on greenhouse gas emissions, carbon sequestration and biodiversity loss. At the same time, it is estimated that **US$460 billion per year** are needed to halt and reverse forest loss by 2030. Currently, domestic and international mitigation finance for forests averages US$2.3 billion per year – less than 1% of the total needed.[44]

Consequently, repurposing harmful subsidies is needed not only to promote deforestation- and conversion-free agriculture and agri-food production, but also to support the uptake of practices that support restoration of degraded lands, including through agroforestry or regenerative agriculture,[45] as well as forest and biodiversity conservation. The value of forests to improve and support agriculture, help build resilience to climate change[46] and contribute to food security[47] and production is evident, but is so far hardly reflected in agricultural (support-) policymaking.

AGRICULTURAL SUBSIDIES AND DEFORESTATION

Agriculture drives more than 90% of tropical deforestation.[48] A portion of commercial agricultural expansion is driven by subsidies, in a range of different ways. However, the transmission mechanisms through which subsidies lead to deforestation are complex and difficult to quantify.[49] A number of efforts have been made to understand these links. For example, a recent study from the World Bank[50] examines the causal link between agricultural price support and deforestation, and estimates that it would be responsible for about 2.2 million hectares of forest loss per year, or 14% of annual deforestation. In addition, the report suggests that subsidies in consuming countries also contribute to tropical deforestation in producing countries (e.g. increasing subsidies to livestock in the USA would have some impact on soy expansion in Brazil, and subsequently on deforestation).

© Andre Dib / WWF-Brazil

REPURPOSING WHY AND HOW?

Many conventional agricultural support and incentive programmes do not achieve their intended purpose and lead to undesirable environmental outcomes.[51] Removing subsidies may reduce those outcomes, but more is needed to support the transition to more sustainable food systems, including behavioral and technological shifts.[52] In this regard, a subsidy reform is not only about removing harmful subsidies but repurposing these resources to ensure effectiveness and long-term sustainability, including consideration of social fairness and inclusion. Sustainable development, poverty eradication and food security must take center stage as most of the agricultural support policies' intention is to increase food security and reduce rural poverty.[53] Therefore, the successful repurposing of subsidies is highly dependent on political will and public perception.

Social, economic and environmental dimensions need to be considered in designing the repurposed subsidy; guidance exists and can be built on, as is discussed below.

From a **social dimension**, the subsidy reform needs to be **just, fair and equitable**.[54] The Just Rural Transition initiative[55] has developed a set of 10 principles aimed at providing guidance and a framework to shift towards just rural food systems, including what this means in terms of desired outcomes, planning and decision-making processes, systemic changes needed, and tensions that must be managed.[56]

From an **economic perspective**, the private financial and social economic costs and benefits of reforming subsidies and repurposing options need to be fully considered. A subsidy reform will entail short- and long-term gains, trade-offs, and winners and losers that have to be fully acknowledged for specific private actors and for the society as a whole.[57] Tools such as FAO's Monitoring and Analyzing of Food and Agricultural Policies (MAFAP)[58] or BIOFIN's new guideline[59] can help identify, analyze and monitor harmful subsidies, their current and true costs (including externalities), redesign options, and socioeconomic and environmental trade-offs.

The **environmental dimension** of the reform contributes to reaching wider societal and development goals. Current and conventional agricultural subsidies, while historically focused on improving food security and progressing on socioeconomic indicators,[60] often lead to undesired outcomes[61] and potentially have wider negative impacts on the environment including driving forest loss.[62] However, many positive examples and studies of public incentives programmes that promote a deforestation- and conversion-free and forest-positive agriculture exist and can be drawn on.[63,64]

CONCLUSION AND RECOMMENDATIONS

There is political momentum and opportunity to repurpose harmful agricultural subsidies to protect forests and other natural ecosystems, as well as to support restoration of degraded agricultural lands and natural ecosystems. Much of the debate has focused on the agricultural sector and food systems, but has neglected the contributions of forests and their wildlife in maintaining ecosystem services (soil health, pollination, seed dispersal, water flow etc.) for the long-term sustainability of agriculture, food systems, and rural people's well-being.

When looking at the role of forests in food production, both the risks and opportunities need to be taken into consideration. If designed correctly, repurposed agricultural subsidies can incentivize a deforestation- and conversion-free agricultural production and at the same time promote forest-positive regenerative agriculture and agroforestry systems, that include sustainable tree-based food production and sustainable intensification[65] through the integration of trees and woodland into farming systems.[66] Since repurposing options entail social, economic and environmental trade-offs and winners and losers, strong political will and societal acceptance is needed (see Case Study: Wonderful Welsh Woodlands).

AN AGENDA FOR ACTION

There has not been a better time to drive this agenda forward, with international attention on the transformation of food systems[67] and the urgency of repurposing environmentally harmful food subsidies (see Deep Dive on Subsidies). At the same time a new EU regulation on deforestation-free products (EUDR)[68] has been adopted, preventing the import of agricultural commodities that are associated with deforestation into the EU. Furthermore, in the Glasgow Leaders Declaration on Forests and Land Use[69]145 government leaders representing 90% of global forests have committed to work together to halt and reverse forest loss and land degradation by 2030, including to "redesign agricultural policies and programmes to incentivize sustainable agriculture, promote food security, and benefit the environment".

While this looks like an obvious opportunity to reconcile forests and agriculture, existing institutional and political silos have to be overcome through strong political will and collective action. What is needed now is a strong action-oriented global agenda driven by ambitious public and private sector champions.

At international level, such an agenda could pursue the following actions:

- Establish a **working group t**hat cuts across and marries work and progress under the **Glasgow Leaders' Declaration**[70] and the **United Nations Food System Summit**[71] with the aim to more explicitly link agricultural subsidies and forest-related goals.
- Create an intersectoral working group (with members from FAO's COFO and COAG) on subsidies, best-practice examples and incentives for agriculture and forests, capitalizing on relevant findings of flagship reports from FAO and WB.
- Establish dialogues and roundtables on sustainable agri-food repurposing **with finance ministers** of forest-rich countries and key consumer governments. This could be facilitated through the **Forest and Climate Leaders Partnership.**
- Establish a task team on the role and promotion of forests and ecosystems in the agri-food agenda under the **Just Rural Transition initiative**[72].
- Use the momentum of the recently adopted **EU Deforestation Regulation (EUDR)**[73] and tailor agricultural repurposing-support programmes to meet the EU's requirements.

At national level, governments can start to identify and reform subsidies and scale up policies and support for deforestation- and conversion-free and forest-supporting agriculture, including through:

- Taking advantage of and engaging in existing support programmes, including FAO's MAFAP, BIOFIN's new guidance on repurposing (see above) and the findings of key research in this space (WB, CIF, ODI, WRI).
- Updating and strengthening National Determined Contributions (**NDCs**) by including targets from the agricultural sector that affect forests.[74]
- Including a national target and/or policies in the National Biodiversity Strategy and Action Plans (NBSAPs) on sustainable agriculture (target 10 K-M GBF) aiming at addressing deforestation and conversion in agricultural production.
- Optimizing the benefits of forests for food production and security by taking policy measures aimed at sustainable management of both forest products and forest ecosystem services,[75] as well as protecting, maintaining and restoring critical forest corridors.[76]

DEEP DIVE

Cross-region efforts to promote a responsible timber supply chain in Gabon

JOHN DODSWORTH, WWF-UK,
JEAN-PAUL OBAME ENGONE, WWF-GABON,
ZHONGHAO JIN, WWF-CHINA

Sustainable forest management practices, such as reduced impact logging, have achieved a great deal in avoiding degradation from logging. Reduced impact logging (RIL), as one example, has been found to reduce species loss in logged areas[77], preserve taxa[78] and reduce impacts on the physical environment[79] including protecting the soil during logging[80], a crucial enabling condition of ensuring forest management does not lead to severe degradation, and leaves forests with the soil, water quality, and seedbanks needed to undergo natural regeneration, post logging. RIL has also allowed management to reduce carbon emissions from logging[81]. Defining degradation is complex, but, green forest economy pathways have the potential to be limiting to high forest cover nations, without embedding the allowance of sustainable forest management as a means to avoid degradation in definitions, goals, commitments and targets, and ensuring the agency to develop economically.

We share here a case study in which Gabon has taken steps to develop a sustainable bioeconomy, with the forest sector representing the largest private sector employer. The implementation of a log export ban, commitment to move towards FSC certification by 2025, creating the enabling environment for processing facilities to operate sustainably, provide examples of the steps Gabon is making.

INTRODUCTION

Gabon is one of the world's most forested countries, with over 88% of its total surface area (267,667 km^2) covered by tropical rainforests. Its floral diversity is linked to the Guinean-Congolese regional center of endemism,[82] and the diversity of its lowland plant species is among the richest in all of Africa.[83] Gabon's forests are also rich in wildlife, with a highly diverse megafauna, including about 60% of the world's remaining critically endangered forest elephants.[84] It also maintains a significant population of western lowland gorillas, mandrill monkeys, forest buffalos, and noteworthy birdlife.

Of the 22 million hectares of forest in Gabon, about 15 million are under logging concessions. The Forest Code makes the sustainable management of allocated forest concessions mandatory, as well as the processing of wood, banning the export of whole logs. In 2018, the Gabonese authorities announced that FSC certification would become mandatory by 2025. At present, there remains a gap between commitments towards the FSC certification and implementation and compliance with Forest Management Certification requirements promoted by the government.

Chinese-owned companies have the biggest stake in Gabon's forest concessions. This case study first looks at the encouraging signs of a shift towards sustainable forest management by Chinese (and other) companies in Gabon, before taking a broader view of China's potential for reducing the demand for illegal and unsustainable timber and fostering sustainable forest management.

CHANGING ATTITUDES

Of the 15 million hectares under logging concessions in Gabon, Chinese timber enterprises represent the largest group, with over half of Gabon's production forest (estimates range from 50-70%) being under Chinese ownership.

A major change WWF has witnessed in Gabon has been a shift in approach by Chinese forest enterprises towards pursuing FSC certification. Increasing the number of Chinese companies reaching certification standards would provide a signal to the market, and a blueprint for Chinese forest enterprises working in Gabon and the wider Congo Basin. This would in turn lead to an uptick in sustainable forest management in the country, and should also lead to positive impacts for biodiversity and the well-being of local communities over the longer term.

Although it is hard to pinpoint one specific cause of the shift, a combination of the Chinese government's roll-out of the amended Forest Law, coupled with the President of Gabon committing to mandatory certification, have both played their part. China's amended Forest Law includes a ban on buying, transporting, and/or processing illegally sourced timber, and requires processing companies to establish a data record of raw materials and products (Article 65, see below). Meanwhile, in September 2018 the former President of Gabon, H.E. Ali Bongo Ondimba, declared that all operating forest concessions in Gabon would have to be FSC certified by 2022 (recently pushed back to 2025). On 31 January 2020 a cooperation agreement was signed between the Ministry of Forests of Gabon and the Forest Stewardship Council (FSC). WWF helped to influence this by raising awareness and advocating to promote legality and FSC certification with the forestry administration, and supporting Chinese forest enterprises to move towards FSC implementation.

© N.C. Turner / WWF

BRIDGING THE CERTIFICATION GAP

In order to meet FSC standards, Chinese forestry companies are in need of capacity building, particularly around community relations, wildlife monitoring and traceability. Relations with local communities and chiefs are challenging with both a language barrier and misaligned expectations, while in some cases enterprises enter the timber sector in Gabon with no prior experience, having been established previously in sectors such as infrastructure.

WWF-Gabon under the UK Foreign, Commonwealth & Development Office (FCDO) flagship Forest Governance Markets & Climate (FGMC) programme has supported the establishment of "Chinese forestry company role models", which should act as benchmarks for other Chinese forestry companies to move towards sustainable forest practices. To do that, WWF-Gabon engaged and enrolled two Chinese forest companies as Forests Forward members (see Case Study on Cross-Region Efforts to Promote a Responsible Timber Supply Chain in Gabon). One of them, Bonus Harvest, employs nearly 200 workers in Gabon and has a forest concession covering 128,000 hectares. The other, Gabon Wood Industries (GWI), has concessions covering over 400,00 hectares.

When WWF-Gabon first started working with Bonus Harvest, few expected the company would achieve FSC certification. Bonus Harvest started active engagement with WWF in March 2021 after participating in a number of WWF group workshops on sustainable forest management and FSC standards. WWF-Gabon subsequently conducted an audit and provided recommendations on issues which needed to be addressed in order to progress towards reaching certification standards.

WWF has requirements that need to be met in order to onboard timber enterprises and offer further support. These include:

- Securing appropriate staff to deal with forest management, environment, reduced impact logging, wildlife/biodiversity, and social aspects
- Careful due diligence and compliance

Further support from WWF-Gabon included technical advice around certification processes, reduced impact logging, community engagement/social inclusion, participatory mapping and FPIC, and wildlife monitoring. Bonus Harvest and GWI have now achieved LegalSource certification. After becoming LegalSource certified, Bonus Harvest immediately engaged in FSC certification, and is seen by many as the leading Chinese timber company in sustainability in Gabon. Its operations have now improved in terms of securing appropriate staff, addressing legal requirements, reducing impact, protecting wildlife and biodiversity, and addressing social inclusion issues.

By supporting Bonus Harvest as an industry role model, FGMC has contributed to a wider shift in intentions across Chinese timber companies. Many other Chinese companies have since enquired directly with Bonus Harvest about how to improve forest management practices, and WWF-Gabon now receives around four enquiries a week from Chinese timber companies who want to work towards more sustainable forest management. Among them, 23 have been undergoing training on aspects of sustainable forest management and certification, while five have been selected to benefit from further WWF support (subject to due diligence).

The trend has also attracted engagement from non-Chinese enterprises. For example, WWF-Gabon is currently carrying out due diligence with the largest company in the Gabon Special Economic Zone (GSEZ), which owns seven forest concessions covering more than 1 million hectares – the company referenced the Bonus Harvest example in its request for support. Currently, GSEZ is in the process of joining WWF Forest Forward, establishing an agreement and action plan to implement good forestry practices and achieve FSC certification.

Another significant opportunity emerged to leverage progress in reducing illegal logging and promote sustainable forest management, when the minister in charge of forests and the environment issued order 41/MEFMEPCPAT/CAB-M on the creation, organization and operation of the legality control and traceability system for Gabonese timber. WWF helped to influence this step forward by raising awareness and advocating to promote the timber legality assurance system with the forestry administration. WWF-Gabon facilitated socialization and the involvement of stakeholders, co-organizing a workshop with representatives from more than 60 forest companies, NGOs, Indigenous Peoples and local communities.

The FGMC programme has made considerable progress since its launch. However, although the results have been positive to date, ensuring a permanent market shift will require more funds to support enterprises with capacity building and training in order to reach a critical mass of certified companies in Gabon.

CHINA'S GLOBAL DEMAND FOR TROPICAL TIMBER

China's imports of logs and sawnwood timber have increased significantly since 1998. By 2014, the total volume of imported logs and sawnwood (equivalent to 87.8 million m^3 of log volume) exceeded the volume of its domestic commercial timber production (82.3 million m^3). China's dependence on imports of logs and sawnwood reached 56% in 2019. China imports timber products from more than 100 countries. The top five suppliers in 2019 were Russia, the EU, New Zealand, the United States and Australia – together they accounted for 57% of China's total imports by value.

For hardwood logs, China's main suppliers in 2019 were Papua New Guinea (21%), Solomon Islands (15%), the EU (12%), Russia (11%) and the Democratic Republic of the Congo (5%). Customs data shows a surge in tropical log imports in recent years from some smaller suppliers, including Sierra Leone, Suriname, Central African Republic and Ecuador, indicating a decentralization trend in China's import sources. African countries have replaced Asian (mainly Mekong) countries as China's main sources of rosewood imports. According to Global Witness, about two-thirds of the world's tropical logs were exported to China in 2018, while most of the top 10 countries supplying China with tropical timber ranked very poorly against metrics for rule of law and control of corruption, with illegal logging rampant.[85]

CHINA'S ROLE IN SUPPORTING A SUSTAINABLE TROPICAL TIMBER TRADE

Due to its size and economic weight, China has an unparalleled impact on tropical forests globally – it is now the world's largest single country importer of tropical timber[86]. As a result, China has a unique economic and political influence on critical markets that represent an economic lifeline for certain forest-rich countries – but equally, if left unchecked, deforestation and forest degradation threaten both the forests and development of these countries and the reputation of Chinese companies operating overseas. In other words, China's actions through both its government and private sector have the power to make or break the ambitions of producer countries to crowd out illegal deforestation from their supply chains and support a transition to green carbon economies in high-forest-cover nations.

The loss of tropical forests is a global issue impacting the rights of Indigenous Peoples, the livelihoods of forest communities, and wildlife habitats. Recognition of China's responsibility for its overseas footprint is now well established in Chinese policy thinking[87] and debates, with China already having declared its commitment to ecological civilization, the establishment of rules-based global environmental governance, and the value of ecological redlines. Domestically, China has put in place extensive environmental protection legislation. The focus now turns to China's overseas footprint, which requires balancing the competing and contradictory forces of national growth, development, and global environmental stewardship.

ARTICLE 65 OF CHINA'S FOREST LAW

China's legislation for addressing illegal timber being purchased, processed and transported into the country potentially has significant consequences for wood purchases at both a domestic as well as a global level.

On 1 July 2020, Article 65 of China's newly revised Forest Law came into force. It clearly stipulates the following: "Timber processing enterprises should establish an account of the entry and exit of raw materials and products. No unit or individual may purchase, process or transport timber that he/she clearly knows was illegally felled or indiscriminately felled in forest regions".

This article provides a legal basis not only for China to address the challenge of the purchase, processing and transportation of illegal timber, but also for Chinese timber trading and processing enterprises to implement their due diligence obligations concerning legally produced timber.

Article 65 provides the basis for China's legislation regulating and supervising the legality of timber sources. At present, most Chinese timber-importing and processing enterprises lack functioning due diligence systems, while their recording of raw material purchases and sales is uneven. In future, businesses need to establish and control their material and product entry and exit accounts to comply with timber legality requirements.

UNCERTAINTY AROUND THE LAW

While Article 65 explicitly provides the legal grounds for preventing illegal timber from entering the supply chain, it is not clear whether this article includes imported timber and timber products – and, if so, how to determine the legality of such products. Several seminars have been organized to discuss this issue, with most participants suggesting that Article 65 should indeed encompass imported timber and that tracking timber legality to its original producing country should be included in the upcoming regulations for the implementation of the Forest Law.

There are also questions around how Article 65 should be implemented and enforced in practice, particularly in relation to timber imports. One option would be to use the CTLVS standard, although this is only voluntary. Another option would be to enforce Article 65 using a national mandatory standard. A third way could be to require Chinese importing companies to ensure transparency in tracing their products back to the country of origin, where possible adhering to standards such as the FSC's and PEFC's.

There are still divergent views on how to verify whether imported wood is "clearly known to be illegally and indiscriminately harvested". Our research team's analysis suggests that not all legally exported timber was drawn from sources that were legally logged. Some timber may have come from illegal sources but was nonetheless imported after legal export documents were obtained through illegal means. In practice, importers should be under an obligation to perform the necessary due diligence and manage the entire timber supply chain to ensure that the timber is legally sourced, rather than simply accepting the timber as legal because it has not been smuggled.

CONCLUSIONS

This case study has illustrated that unsustainable and illegal logging can be addressed at both ends of the supply chain: with Chinese-owned companies operating in Gabon and by China's own policy commitments.

In Gabon, the FGMC project has inspired forest companies to implement good forest practices and make progress toward certification. This is a positive start, but significant resources are still required to ensure a more profound market shift.

However, given the differing legislation across the Congo Basin and the prominence of Chinese enterprises across the timber sector, this work needs to go beyond the borders of Gabon and into ROC, Cameroon and DRC. Ensuring a strong legal and sustainable timber sector in the Congo Basin and working with Chinese timber enterprises will be crucial to secure the well-being of the forests and the people that depend upon them, as well as crowding out the illegality that risks preventing these countries from developing economically, equitably and sustainably. The impact of this, whether successful or unsuccessful, will be felt well beyond the borders of the Congo Basin, and will require international support and investment.

As the world's largest importer of logs and sawn timber, as well as being an important consumer market for timber products, China can help timber-producing countries improve their forest governance and reduce illegal logging. Such actions would demonstrate that China is taking its responsibilities in this arena very seriously, and align to the ambitions it has set through multilateral forums such as ASEAN and FOCAC for equitable South-South trade and development.

© Martin Harvey / WWF

DEEP DIVE

Voluntary carbon finance mechanisms can provide needed finance for forest protection and restoration

DAMIAN FLEMING, WWF INTERNATIONAL, AND COLLEAGUES

CARBON FINANCE FOR FORESTS TO DATE

Significantly greater investments in protecting and restoring nature and its ability to sequester carbon are necessary if we are to deliver on the Paris Agreement, the Kunming-Montreal Global Biodiversity Framework and the Glasgow Declaration on Forests and Land Use. It is widely acknowledged that mobilizing private finance will be crucial, alongside public and philanthropic funding. The voluntary carbon market (VCM), originally intended as a bridge to future compliance markets, has been widely heralded as one of the most promising market-based mechanisms: it has grown to around US$2 billion in size and is projected to grow at least five-fold by 2030. The appeal of carbon markets is easy to understand. However, the voluntary market remains small and a drop in the ocean of what is needed overall to protect, conserve and restore forests and other ecosystems globally.

The VCM has been tarnished by credibility issues that have been more publicly exposed[88] in recent years. Criticism is centered around three main areas. First, on the demand side far too many companies are relentlessly focusing on offsetting and using carbon credits as a short-cut to meeting spurious net-zero or carbon neutrality claims – favoring high-volume, low-quality, low-price credits, and as a substitute for setting and delivering on credible science-based decarbonization pathways. Second, on the supply side there are credibility issues related to performance measurement and verification based on the market's need to establish counterfactual baselines which often leads to carbon benefits being overstated (e.g. through inflated baselines, or leakage to adjacent areas outside the project site), or where benefits risk being reversed later on due to policy shifts or enforcement failures (permanence issues). Third, another major criticism is that the market actors fail to fully engage with local communities during the project design and benefits are not equitably shared.

However, we certainly do not want to turn off the tap to private sector finance that supports inclusive programmes that restore and protect our forests and other ecosystems. There are positive examples and important voices[89] in support of REDD+, the VCM and other approaches to mobilizing private finance.

To address many of the weaknesses of the VCM, there are a number of efforts to better regulate the market and facilitate a rapid transition towards high-quality, high-integrity projects – including national regulation and guidance from the Integrity Council for the Voluntary Carbon Market,[90] Voluntary Carbon Markets Integrity Initiative[91] and the Tropical Forest Credit Integrity Guide[92] – all of which is welcome.

However, due to the systemic nature of the problems outlined above, there are growing calls for a more fundamental shift away from certified tonne-for-tonne based approaches towards a money-for-tonne contribution approach.[93]

A NEW MODEL OF NATURE AND PEOPLE-POSITIVE CARBON FINANCE

A first fundamental shift is for all companies to be both decarbonizing as rapidly as possible (Scope 1, 2 and 3 emissions) and investing in protecting and restoring nature.[94] It is not either/or. Safeguarding forest and other ecosystems requires on one hand urgent and total phase-out of fossil fuels, the largest driver of the climate crisis, and major investment in renewable energy. On the other hand, it also means conserving 30-50% of land, ocean and freshwater sinks.

A second fundamental shift is from offsetting by companies towards a contributions approach. Offsets are far too frequently being used as a substitute for deep emissions reductions, and equally are ill-suited to the uncertainties that are inherent to the voluntary carbon market. It is almost impossible that each certified tonne of avoided CO_2 emission will prove real in an ex-post analysis, particularly for projects with a goal of reducing emissions from deforestation, and impossible to guarantee against reversals at some point in the future, or leakage outside of the project area. For these reasons, one tonne of carbon emitted by burning fossil fuels is never equivalent to that saved from a forest-based project, so offsets are essentially a false economy. At the same time, investing in forest and ecosystem protection and restoration yields multiple benefits, not just carbon sequestration. Through a contribution approach,[95] companies first account, disclose and reduce their value-chain emissions in line with an ambitious science-based target, and then quantify their remaining emissions and – using a fair price of carbon[96] – invest the resulting financial resources in activities or programmes for people, nature and climate impact where they are best able to make the most telling contribution towards global goals. These investments are not considered offsets, nor are they the basis for carbon neutrality or related claims. We are seeing many companies turning towards this approach. WWF is working with Gold Standard to develop guidance on the claims companies can make while following this approach.

Third, we need a shift from isolated projects to national and jurisdictional scale programmes (and nested projects within them), with long-term investment, and human rights and environmental due diligence, in order to effectively tackle deforestation drivers and circumvent issues of leakage and permanence. Technical assistance accompanying climate finance is crucial in setting baselines and appropriate policy frameworks and enabling good governance. WWF's NBS (Nature-based solutions) Origination Platform has recently been established to provide critical ex-ante finance in addition to project finance to collaboratively scope, develop and deliver NbS portfolios that address threats and drivers efficiently, incorporate transparent and equitable governance and benefit-sharing mechanisms, and generate durable impacts for climate, biodiversity and sustainable development in a combined manner.

A further important shift is from wholly market-driven approaches to a focus on impact and landscape needs, and those of local communities. Market approaches naturally incentivize low-cost, high-volume transactions, and with a current average carbon price of less than US$10 a tonne it isn't surprising that we have such an abundance of low-quality projects. We must shift focus towards scaling climate funding for impact, including co-benefits beyond carbon, as acknowledged in the innovative finance paper released by the GEF earlier this year.[97]

NEED FOR INNOVATION

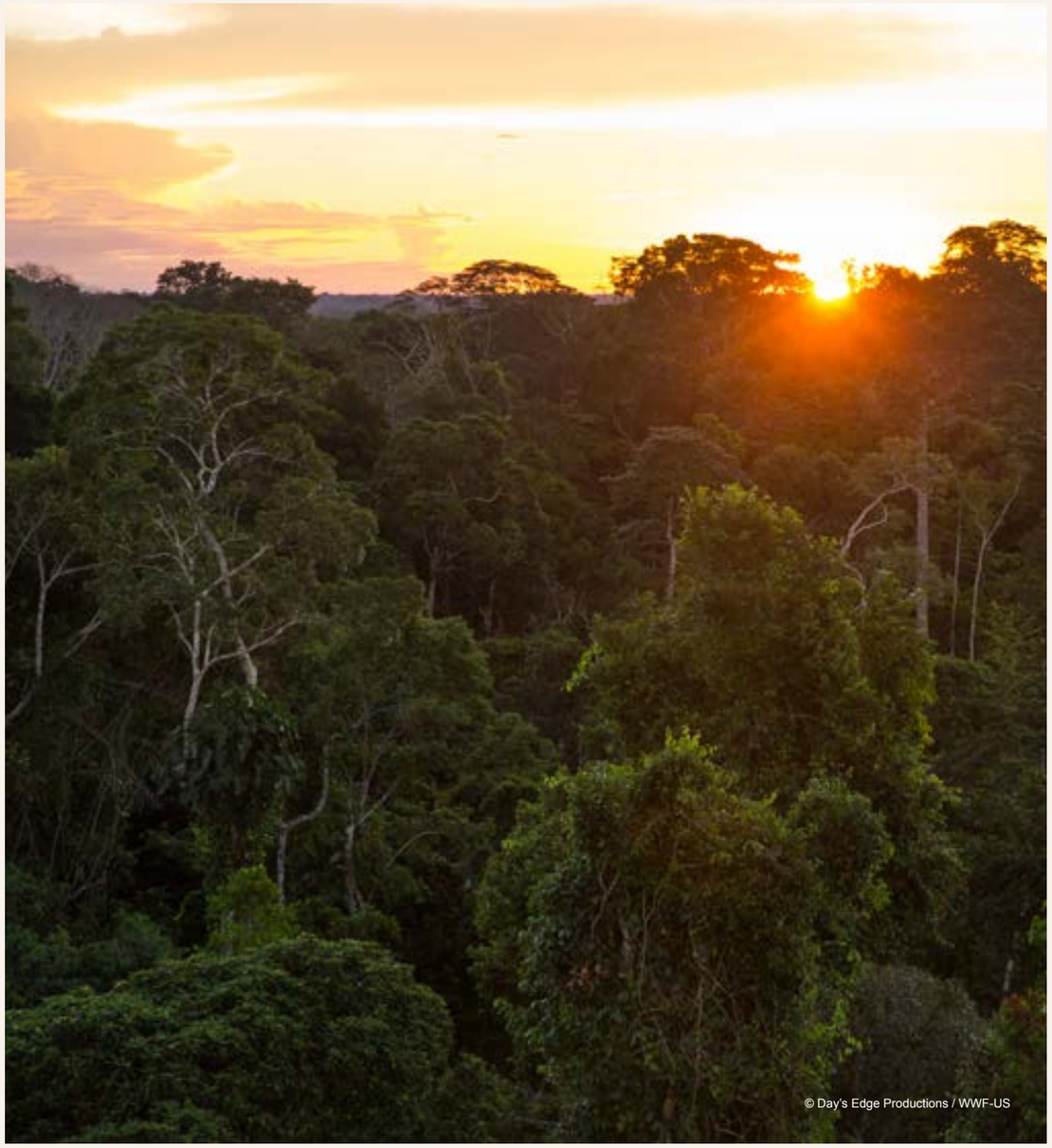
There is an urgent need for new mechanisms that deliver finance to the world's most critical forests and the local communities and IPs that live in and around them. Countries with largely intact natural forests have significant, untapped and cost-effective mitigation potential in NbS that could be mobilized through carbon finance. However, with accounting systems focused on emissions reductions or removals coupled with low carbon pricing, these countries are not sufficiently rewarded for taking action to conserve their forests. WWF is working with Congo Basin governments (see Deep Dive: Cross-region efforts to promote a responsible timber supply chain in Gabon) to explore innovative mechanisms that provide greater financial incentives to protect forests and stimulate a green economy. There is increasing interest in biodiversity credits[98] as another mechanism to deliver market-based finance, although the market is very young with little demand signal to date – and it will also need to overcome many of the criticisms of the carbon market listed above.

CONCLUSION AND RECOMMENDATIONS

Forest-based countries' calls for greater finance to conserve and restore forests and support a green economy are increasing in volume.[99] Alongside this there are growing efforts to develop new mechanisms and platforms to enable finance and technical assistance to flow, including the Forest Climate and Leaders Partnership launched at COP27.[100] Voluntary carbon finance undoubtedly has a contribution to make. A limited fraction of these investments can be done via high-quality market-based approaches, but there are a wealth of opportunities using non-market-based approaches which should be favored. Key recommendations include:

- Greater demand-side regulation towards a level playing field that supports and rewards companies to both rapidly decarbonize and invest in long-term, high-quality NbS through a contributions approach that fairly prices carbon.
- Ex-ante finance to support countries and jurisdictions to develop high quality programmes with multiple benefits, including support for participatory planning, feasibility assessments/spatial mapping, capacity-building and partnership development, implementation planning and costing, carbon accounting, financial modeling, and strategic aggregation of activities to achieve transformative impacts at scale. WWF is establishing an NBS Origination Platform in selected priority landscapes to service this need.
- Support to develop new finance mechanisms that incentivize the conservation of high-integrity forests alongside investment in a green economy, tailored to local contexts.
- Greater clarity in NDCs, NAPs and LT-LEDS in terms of ambitious, quantitative GHG targets for forests, the use of carbon markets to meet climate goals, and the inclusion and participation of IPs and local communities in policy processes and implementation.

There are well publicized global concerns over the integrity of the voluntary carbon markets. However, as part of the process of laddering up to a compliance framework for nature recovery, if demand and supply side carbon market integrity issues are fully addressed, carbon and biodiversity credits can make an important contribution to financing landscape level restoration. WWF believes there is still a place for high quality high integrity carbon credits, with strong safeguards.


© Day's Edge Productions / WWF-US

DEEP DIVE

Do we need a new Global Nature Bank?

KAREN ELLIS,
WWF-UK AND COLLEAGUES

INTRODUCTION

Deforestation is largely driven by economic activity that delivers incomes to local producers and profits to national and global companies through global supply chains. The financial benefits to the producer greatly exceed the value in financial terms of leaving the forest standing. These are profitable investment opportunities, and as such, are easily able to access private finance (e.g. loans or equity investment) from banks and other financial institutions.[101] The dysfunctionality being that, the value of forest conversion only outweighs that of standing forest because the true value of the forest – to nature, people and climate – is not accounted for, a particular risk with regards to tropical forest biomes due to their contribution to climate stability.[102]

Stemming the financial flows that bankroll forest destruction is vital if the alternative forest finance mechanisms being tested at the moment (See section X) are to succeed. However, the economic models currently in charge of the global forest-agriculture system will mean compensating forested nations that could lose out as subsidies and finance flow pivot away from forest conversion. We lay out here some thinking around a potential alternative financial mechanism.

© Brent Stirton / Getty Images / WWF-UK

THE ROLE OF THE PRIVATE SECTOR

The role of the private finance sector in enabling and incentivizing deforestation has come under increasing scrutiny, and a growing number of private financial institutions have made voluntary commitments aiming to reduce their financing of deforestation, such as through the FSDA.[103] However, the scale of these financial flows is enormous and represents one of the biggest barriers to halting deforestation. Public finance and aid flows for forests cannot compete with, or in any way come close to offsetting this huge tide of destructive finance.

It is hard to estimate flows of private finance underpinning deforestation, given the lack of traceability, transparency and accountability down supply chains. However, the estimates that do exist[104] suggest these financial flows are very large:

- Global Canopy estimated that financial institutions invested US$3.6 trillion in forest-risk companies in 2022.
- A 2021 study by Global Witness105 found that banks and asset managers based in the EU, UK, US and China had made deals worth US$157 billion with firms accused of destroying tropical forest in Brazil, Southeast Asia and Africa since the Paris Climate Agreement, and that these financial institutions obtained US$1.74 billion in interest, dividends and fees from financing the parts of agribusiness groups that carry the highest deforestation risk – primarily soy, beef, palm oil and pulp and paper.
- A study carried out for WWF calculated that for UK financiers alone, financial flows at risk of contributing to deforestation from Brazilian soy and beef and Indonesian palm oil supply chains stood at £200 billion in 2021.
- NGO Global Witness found that 360 asset managers participating in the Global Financial Alliance for Net Zero held forest-risk investments worth US$8.5 billion as of September 2022, a reduction of only around 3% in the size of forest-risk investments held in the year since COP26.

It is clear that voluntary commitments made by private companies to tackle deforestation have not worked. This is why the UK, the EU and the US are all considering new laws to try and curb the financing of deforestation.

Reducing private finance flows which are driving deforestation is therefore the top priority. However, this will have negative economic impacts on countries dependent on exploiting their forest assets. Thus, new financing mechanisms are needed to facilitate, incentivize and reward the protection and sustainable management of forests. This will also be crucial for the more than 1.6 billion people estimated to be dependent on forests for timber, food, fuel, jobs and shelter.[106] Often forests are located in developing or emerging countries which have a justified desire to continue to develop their economies, but which have often struggled to access the finance needed to support a sustainable development trajectory.

This arises for many reasons, including often relatively underdeveloped financial sectors and associated green financing mechanisms, a lack of data on environmental impacts and risks, and relatively high investment risks associated with developing countries which deter private investment generally, and sustainable finance flows in particular.[107] The lack of concessional finance to support sustainable development pathways has also been criticised, and there are growing calls for reform of the multilateral development banks to better support sustainable development trajectories.[108] UNDESA's *Financing For Sustainable Development Report 2023* highlights that global sustainable development prospects are diverging and that financing to support sustainable development pathways is relatively low and has fallen further in recent years for many developing countries.

The challenge is that we need financial flows to invest in the protection, restoration and sustainable management of forests in developing and emerging markets, of the scale that is only available from the private sector, but without the requirements for financial returns that private finance demands.

One proposal to address this challenge is the creation of a new "Global Environment Bank", to which the private sector would be required to contribute on an annual basis, at a level determined by a single, well-reported measure – perhaps by turnover, or profit, or perhaps by residual carbon emissions if reporting of such data allows this to be verified adequately – or indeed by exposure to deforestation.

Ideally we would use a metric that helped to disincentivize environmentally damaging investments, but the challenge with such measures is the lack of robust and comparable company data, and though progress on company disclosure requirements on their carbon emissions and nature risks and impacts is moving quite fast in some jurisdictions (e.g. through the Taskforce for Climate Related Financial Disclosures, the Taskforce for Nature Related Disclosures and the International Sustainability Standards Board) this is still at a relatively early stage, so data on these issues would be very patchy. Thus it may be easier, in the first instance at least, to simply base the "tax" or levy on the size of the company, as measured through a simpler and more well-reported metric such as turnover.

This could in effect be a "Nature Recovery Tax" – which could be seen as a necessary and relatively simple way to start valuing nature in our economic system, and to pay for the natural capital upon which our whole economy depends. If applied across the board, this tax could be set at a very low level for an individual company, yet it would still add up to a very large number across the whole economy.

The Global Environment Bank would then utilize the revenues generated to finance the ongoing protection of those natural assets located in the developing world that are generating the largest social good at the global level. Importantly, this would not require a *financial* return to be generated by the beneficiaries, which would remove a significant barrier to financing for many forested nations. But it would require some proof that protection or reforestation is effectively being provided. Thus ongoing financing would be reassessed on an annual basis to ensure those natural assets were actually being protected, e.g. using global satellite data backed up by some field data to provide ground-truthing and assess, for example, the extent and condition of wildlife, all paid for by the Global Environment Bank – and any failure to provide adequate protection and deliver the outcomes expected would reduce the finance being made available.

The amount paid to a particular forest community would need to be enough to cover not only the maintenance and enforcement costs associated with protecting those natural assets, but also the opportunity costs associated with their use, if it is to effectively incentivize their ongoing protection. This would in effect constitute a global, mandatory payment for ecosystem services scheme.

Companies could potentially be allowed to increase their contribution voluntarily in order to support the delivery of their own net-zero or nature-positive targets and commitments if they chose to do so, but it would be crucial for the basic contribution to be mandatory, and be applied across the board – ideally at the global level – as the more countries and companies that participate, the smaller the tax required. While this represents a small additional cost to business upfront, it will substantially reduce the costs it will face going forwards arising from the otherwise ongoing environmental destruction. Protecting a forest is relatively cost-effective compared to many other investments that will be required to support the net-zero transition, e.g. to develop new technologies.

RECOMMENDATIONS

We share this Big Idea thought piece as a way to start conversations about addressing the lack of finance for forests, raised in Section 2.1. A Global Nature bank could help close the forest finance gap by:

- Not requiring financial returns, with all the complex policy implementation, human and institutional capacity and data that requires.
- Raising far more finance than could ever be available through public/government/concessionary funding sources, and that can therefore provide strong enough incentives to overcome opportunity costs, and pay for the capacity-building needed to monitor implementation.
- Permitting nationally prioritized and locally designed forest management solutions to be developed, free from the stipulations imposed by capital and nature markets created in the Global North.


© WWF-Netherlands

DEEP DIVE

How selective logging can lead to forest loss, and what's being done about it

COLMAN O CRIODAIN,
WWF INTERNATIONAL

It is entirely understandable that those who are concerned with forest conservation at the global level focus primarily on forest clearance. The scale of deforestation worldwide, and especially in the tropics, represents an existential threat to humankind, because of its implications for climate change and the provision of essential ecosystem services. By comparison, concerns about declines in individual first-living species can seem of less importance.

However, on closer examination, there are many animal species whose depletion erodes the integrity of forest habitats; forest elephants and primates being just two examples. But here we will confine ourselves to wild tree species that are highly valued in international trade, either for their timber or for other products, and thus are removed selectively from their forest habitats. Examples are rosewoods (*Dalbergia* species and other genera), mahoganies (family Meliaceae but certain trees from other families are also known as mahoganies in trade), cumaru (*Dipteryx*) and ramin (*Gonystylus*), all of which are valued for their timber, while agarwood (*Aquilaria* and *Gyrinops*), lignum-vitae (*Guaiacum*), frankincense (*Boswellia*) and African stinkwood (*Prunus africana*) are all heavily traded for their aromatic or medicinal derivatives.

If these species are selectively harvested, why is their overexploitation a problem for forest conservation? Is it not better to allow communities to profit from them if the rest of the forest remains intact? Well, there are several reasons why we should be concerned.

First of all, forest tenure by local communities is often insecure, so that the communities who live in or close to the forest are not necessarily the ones who benefit from its exploitation. Often the benefits go to criminal gangs or corrupt entities who have usurped tenure.

More importantly, most of these species can be exploited sustainably, if the harvest is carefully managed. Measures such as setting minimum size, and leaving some mature trees to disperse seed, ensure the continued availability of the resource into the future. By contrast, overexploitation is analogous to a family that sells the family home to meet a short-term need. It generates income in the short term, but it leaves communities impoverished in the long term.

In addition, these species are an integral part of the forest ecosystem, and their removal erodes the integrity of the ecosystem. Many of them provide food or other benefits for both animals and people. Effectively, depletion of these species is a form of habitat degradation. Degradation, as we know, compromises the ecosystem services provided by forests; in that sense it is just as serious as complete clearance.

Finally, and most compellingly, these species are what makes intact forests a valuable economic asset. As such, the economic value of forests is largely lost once these valuable species are depleted, making alternative uses of the land more attractive in economic terms. Depletion of forest species is often a prelude to complete clearance.

Many of the mechanisms and measures that have already been developed and applied to forest conservation more broadly can also address the issue of selective removal of higher-value species.


© Flavio Conceição / WWF-Brasil

To begin with, it is crucial that we continue to focus on issues of forest tenure, so that those who live in or around the forest play a key role in deciding its future. If, as often happens in regions where governance is weak, outside interests are given a free hand to exploit forest resources, there is a much greater risk that they will focus on short-term profit, especially if those outside interests are organized criminal groups.

Secondly, credible certification schemes can add value to forest products, while ensuring that the harvest of the species that provide such products is rendered sustainable.

However, where the value of the species or its products is particularly high, especially when in international trade, further measures are necessary. Otherwise, it is hard for poor countries with weak governance to resist pressure from vested interests to exploit these species unsustainably for short-term gain.

The Convention on International Trade in Wild Fauna and Flora (CITES) was negotiated in 1973 but had its origins 10 years earlier. In recent years it has often been portrayed as a punitive instrument that curtails economic freedom and national sovereignty. But we should remember the motivation that lay behind it. In its eloquently concise preamble, it recognizes that, while "peoples and States are and should be the best protectors of their own wild fauna and flora", it is also the case that "international cooperation is essential for the protection of certain species of wild fauna and flora against over-exploitation through international trade". This is an excellent summary of the underlying *raison d'etre* of the Convention.

CITES listed a number of tree species in its Appendices from the outset. However, for the most part they were extremely rare species that were so near to commercial extinction that any further exploitation would be disastrous. Many were listed in Appendix I of the Convention, the 2% of the total number of species regulated by CITES that are so depleted that further commercial trade is banned. It is only in the last 30 or so years that CITES has begun to focus on species where there is still scope for viable commercial trade, but where the risk of overexploitation, driven by demand in international trade, is high. Such species qualify for listing on Appendix II, which comprises nearly all the 38,000 species whose trade is regulated by the Convention.

For such species, commercial trade is allowed if the specimens in question were legally obtained, and if an independent scientific authority has advised that the export will not be detrimental to the survival of the species; the so-called non-detriment finding. Thus, in 1994 at the ninth meeting of the Conference of the Parties (COP9), Afrormosia (*Pericopsis elata*), African stinkwood (*Prunus africana*) and one agarwood species (*Aquilaria malaccensis*) were listed in this Appendix. In 2002, at COP12, in the face of concerted opposition from some range states, bigleaf mahogany (*Swietenia macrophylla*) was listed in Appendix II, the most commercially important species listed up until that time. Ramin (*Gonystylus* species) was listed in Appendix II at COP13 in 2004, and the remaining key agarwood species (*Aquilaria* species and *Gyrinops* species) were also added that year.

Progress was slower in the decade that followed. However, in 2013, at COP16, in response to the crisis regarding illegal logging in Madagascar, all that country's rosewoods and palisanders (*Dalbergia* species), and ebonies (*Diospyros* species) were added to Appendix II. In 2016, at COP17, the entire genus of *Dalbergia* was listed in that Appendix, signaling an increasing tendency to list species at the generic level to avoid laundering of endangered species as non-listed lookalikes, a safeguard that is provided for in the Convention text, even when some of the species in question are not themselves at risk. At COP18, in 2019, cedro (*Cedrela* species, also members of the mahogany family) was added to Appendix II. Finally, COP19 in 2022 earned the nickname in some quarters of the "COP of the trees", when it added several genera of precious, slow-growing Latin American timber species to Appendix II: cumaru (*Dipteryx* species) and trumpet trees (*Handroanthus, Rhododendron* and *Tabebuia* species). African populations of three further genera were also added: *Pterocarpus* (which includes the species kosso, *Pterocarpus erinaceus*, already listed in 2016), *Khaya* species (African mahogany), and *Afzelia* species (doussie).

These listings, all of commercially important species, all in Appendix II, have raised the profile of timber in CITES. Whereas the Plants Committee, the plant science committee of the Convention, used to devote most of its time to discussions on ornamental or medicinal plants, timber species now occupy a major part of the meeting agendas. Producer groups, including those representing musical instrument manufacturers and users, and those engaged in the manufacture of aromatic products, are engaging with the Convention. On the other side of the divide, members of conservation NGOs who previously attended only the Animals Committee are often showing up at Plants Committee meetings. The Convention Secretariat, together with the International Tropical Timber Organisation, provides capacity and funding (the latter largely thanks to the EU) to assist range countries in implementing the listings. And, in a number of instances, trade from non-compliant countries has been suspended; Lao PDR for Indochinese rosewood (*Dalbergia cochinchinensis*), some West and Central African countries for kosso (*Pterocarpus erinaceus*), and Madagascar for its ebonies (*Diospyros* spp.), rosewoods and palisanders (*Dalbergia* spp.) being just three examples.

None of this is to suggest that all the problems concerning international trade in high-value timbers have been resolved. Some problems have arisen along the way, including the following:

1. **Listing a species too late:** It took four attempts over 10 years to get bigleaf mahogany listed in Appendix II. COP14 in 2007 rejected a proposal to list cedro, and it was 12 more years before another proposal was tabled and passed, by which time the most valuable species *(Cedrela odorata)* had been severely depleted.

2. **Delayed entry into force of listings:** The listing of bigleaf mahogany in Appendix II, when it finally did happen in 2002, was accompanied by an annotation delaying the entry into force for one year. Ostensibly it was to give countries more than the usual three-month window to prepare for implementing the listing, although really it was part of a compromise to get the necessary two-thirds majority vote at COP12. Some countries, notably Peru, exploited this window to engage in rampant overharvesting. Against that background, it is unfortunate that the listings of cumaru and trumpet trees agreed last year have a two-year delay for entry into force, especially since Peru is a country with a history of difficulties in implementation of timber listings. When big leaf mahogany was listed on Appendix II in 2002 with a delay of a year for entry into force, there were widespread allegations that Peru exploited the window to offload timber stocks whose harvest would not have complied with CITES rules.

3. **Annotations:** The option exists, when listing plants in Appendix II, to annotate the listing so that certain parts and derivatives are exempted. The norm for Appendix II timber listings is to exempt all parts and derivatives except logs, sawn wood, veneers and, sometimes, plywood. The intent is to capture the trade at the point of first export but to reduce the administrative burden for trade in finished products that are manufactured outside the range states. In practice, getting the balance right can prove difficult. When the entire *Dalbergia* genus was listed in 2016 it was considered necessary to include larger finished products within the scope of the listing because of their high value, while exempting musical instruments and other smaller worked items. However, the initial annotation was worded too inclusively and generated a lot of extra work with little conservation benefit, so that it had to be amended in 2019. More commonly the reverse can occur. A proposal by Thailand to list Indochinese rosewood in Appendix II was successful at COP16 in 2013 with the standard exemptions. However, Thailand had to come back to secure COP17 approval for listing all parts and derivatives of Indochinese rosewood because of the scale of illegal trade in Southeast Asia. In recent years, DRC started exporting sawn wood of afrormosia that was planed or had a tongue-in-groove joint on one edge, claiming that it was exempt under the annotation. This necessitated a narrowing of the annotation in 2019.

4. **Non-detriment findings:** As stated above, issuance of export permits for Appendix II species requires prior advice by an independent scientific authority in the country that the export will not be detrimental to the survival of the species, advice that is known as the non-detriment finding or NDF. In practice, permits are frequently issued with weak NDFs or none at all. In some cases, this has led to trade suspensions, and the EU also has a mandate in its legislation to refuse imports where it believes the NDF to be insufficient. However, many more cases go under the radar.

5. **Corruption and criminality:** Illegal export, transit and import of listed species continues because of organized criminal groups, and often because of the corruption or complicity of figures in authority, from rangers right up to senior politicians. The largest ever seizure of any CITES species was a shipment of 30,000m3 of rosewood from Madagascar that was seized by Singapore en route to China. A minister came from Madagascar to testify that the shipment was legal, despite the existence of a moratorium on exports, and the shipment is now in legal limbo. It is not unknown for prosecutors in Madagascar who are deemed "overzealous" in their pursuit of illegal logging kingpins to be removed from their posts, while environmental human rights defenders have frequently been imprisoned on trumped-up charges.

6. **Reluctance to use the compliance mechanisms available under CITES:** One of the strengths of CITES is its compliance mechanisms, which allow for all trade in CITES-listed species or trade in certain species of concern to be suspended when there is evidence of non-compliance. In practice, however, parties to CITES, acting through the Convention's Standing Committee, are reluctant or slow to apply such measures, by which time much damage can already be done.

So where do we stand now? Nobody is suggesting that CITES is the silver bullet for preventing illegal or unsustainable trade in high-value timbers. As with all harmful commodity trade, there is no single measure that can achieve this; rather a suite of measures is needed. But CITES has demonstrated its capacity to evolve and has proved its worth as one of the key weapons in the fight against unsustainable trade in timber and other forest products. Thus, it contributes to forest conservation more broadly.

DEEP DIVE

The dark side of the timber trade

JOHN DODSWORTH,
WWF-UK

INTRODUCTION – SCALE

Forests are home to approximately 80% of the world's terrestrial biodiversity[109] and support some 1.6 billion people worldwide, who rely directly on forests for food, shelter, energy and income.[110] The formal (legal) forest sector contributed over US$1.5 trillion to national economies across the world in 2015;[111] it directly employs just over 18 million people, and supports a further 45 million jobs through indirect employment across the supply chain.[112] However, illegal logging continues to threaten the world's forests, perpetuating corruption, fuelling social conflict, and depriving governments of revenue.

According to Interpol the illegal timber industry is worth almost US$152 billion a year,[113] and accounts for up to 90% of tropical deforestation in some countries. It causes serious economic, environmental and social damage, and in some cases fuels conflict. Illegal logging undermines the livelihoods of millions of people who depend on forests for their survival, disincentivizes timber enterprises from operating within the law, and erodes the natural resource bases of countries that depend on these ecosystems.

The impact of illegal logging is far-reaching, with devastating environmental, social and economic consequences. It is responsible for deforestation, habitat loss, species extinction, and is often the initial foray into wider land conversion for agriculture. Illegality in the timber sector can take many forms, including but not limited to the logging of protected species (e.g. CITES listed), harvesting and transportation of logs from countries that have national log export bans, logging in protected areas, misrepresentation of logging permits, and overharvesting and not respecting the rights of local communities. This list is by no means exhaustive but provides a snapshot of forms of illegality that aid and abet activities that undermine emergent forestry sectors. Illicit proceeds from forestry crime may also be used to fund conflict, as well as support other organized crime types such as drug trafficking and arms, thus undermining countries' ability to develop.

GLOBAL SHIFTS IN THE TIMBER SECTOR

In the last 20 years there have been significant shifts in the timber sector: a report from Chatham House notes that while some advances had been made in addressing the illegal timber trade, progress has been slipping. This regression has been attributed to three main factors. Firstly, new markets have emerged for high-value timber that have less stringent policies relating to timber legality.[114] Secondly, forests are increasingly being cleared for agricultural commodities to meet global demand. As much as half of all tropical timber traded internationally now comes from forest conversion, of which nearly two-thirds is thought to be illegal.[115] Thirdly, small-scale production has increased in many countries, and these operations often sit outside the scope of policy and regulatory measures, and are often incorporated into larger timber operations.

Corruption

The Chatham House report describes how "low wages, inadequate capacity and insufficient training provide an enabling environment for corruption and abuse of power as well as for the pursuit of informal sources of personal revenue"[116]. This enabling environment is entrenched in illegal logging operations, with a wide range of people involved at all stages of the supply chain, from field officers to high-level representatives (e.g. to obtain logging permits, to avoid controls, and to export and import illegal timber). An Interpol report from 2016 notes that the forestry sector estimates the annual global cost of corruption to be worth some US$29 billion.[117] Given the forest industry is a key income-generating sector, the leakage of funds outside of official channels is a significant loss. As an UNCTAD report from 2019 notes, "Illegal logging and illicit trade in timber undermines sustainable economic growth, economic development and environmental conservation…[and] not only puts the livelihoods of forest-dependent communities at risk, but also undermines legitimate commerce within the forestry sector by distorting timber markets and reducing profitability".[118]

In summary, corruption is considered one of the main blocks to progress in reducing illegal logging. An example of the scale of the illegal profits that it can bring is with rosewood, the most trafficked wildlife species, with sellers making up to US$50,000/m^3 and with a value increasing 700 times between the criminal logger and end buyer. [119] The timber sector attracts corruption as it remains a profitable sector with high margins and international markets to export to, and continuing demand for high-value tree species.


© WWF-Brasil

CRIME CONVERGENCE - MEETING OF BAD ACTORS

The illegal wildlife trade and illegal logging operations are closely interlinked. Illegal wildlife and timber often move through the same geographical hotspots, and traffickers use the same trading and shipping methods. A UN report notes that the same transnational criminal syndicates are behind both illegal wildlife trading and forest crimes.[120]

This convergence has been seen in links between the illicit narcotics trade and links with illegal mining and the illegal timber trade in Latin America. This shows the co-dependencies between organized criminal groups, who use legal trade routes to move their illicit cargoes and utilize the global financial system to move funds around the world, often behind shell companies and offshore companies.

THE TRUE COST OF ILLEGALITY

As discussed, the illegal timber trade is estimated to be worth up to US$150 billion[121] a year, with one report noting that "Illegal logging [is] responsible for a loss of public assets in developing countries in excess of US$10 billion annually to which must be added an additional US$5 billion annually in lost taxes and royalties".[122] These numbers are likely to be at the lower end of the scale. This compares to the total official development assistance (ODA) commitments by members of the Development Assistance Committee (DAC) in 2022, which was US$204 billion.[123] This highlights the size and scale of the financial losses that could otherwise support countries to develop equitably and support standing forests. However, these illicit financial flows generate significant profits for organized criminal groups and corrupt government officials, undermining global, regional and national initiatives to protect and support forest economies.

STEPS TO ADDRESSING ILLEGALITY

There is global recognition of the vital role forests play in global climate, biodiversity conservation and livelihood generation for countless IPs and local communities, in addition to the climate mitigation they provide by storing hundreds of gigatons of carbon. However, the illegal timber trade continues to threaten the planet's large forest basins (including the Amazon, Congo and Southeast Asian tropical forest biomes), with further impacts elsewhere including within Asia, South America and temperate and boreal forest biomes. This threat converges with other serious organized crime to limit opportunities for forested nations and territories to fully involve green and just forest economies in their sustainable and equitable development.

Therefore the following points are of utmost importance:

Strengthened law enforcement – Timber ministries and associated government departments must ensure adequate training and resources are allocated to allow for effective investigations and enforcement to address the illegal timber trade. A number of countries have instituted digital timber legality assurance systems which, if properly implemented, can play an important role in controlling illegality and corruption.[124] Governments should also invest in control technologies such as wood ID testing,[125] remote monitoring by satellites and drones, tracking devices that can be embedded in trees, roadside surveillance cameras that monitor logging trucks, etc.

Coordination between government departments and export countries – Forestry crime is not just a conservation issue but has ramifications far beyond forests for economic growth, equitable growth, climate action, and wider health of governance within the country. Coordination between countries' financial intelligence units and forest authorities will be crucial to ensure that investigations do not end at the point of seizure of the cargo: instead, "following the money" can start at that point to trace where the money has gone, and seek to prosecute or freeze assets.

Ensure forest crime is seen in the same bracket as serious organized crime – The reality at present is that forest crime is not prioritized in the same way by countries. However, as outlined above and by new research, forest crime and more broadly environmental crime can no longer be viewed as just a conservation issue. The UN reports that illegal logging accounts for between 15% and 30% of global timber trade, and rises to 50% to 90% of the trade from tropical countries.[126] Therefore the illegal timber trade remains a low-risk, high-reward sector and it will require national, regional and international collective action to shift that balance to ensure that forests are protected and sustainable forest sectors are able to thrive.

The private sector needs to step up efforts to avoid illegal wood – Steps need to be taken to ensure that companies (as well as government officials and other actors) can more easily assess, understand and manage the most significant risks associated with timber procurement. There are a great deal of resources that have been developed to support these ends: a good example is WWF's new Wood Risk Tool,[127] which consolidates inputs from several respected, independent international organizations focused on conservation and anti-corruption to provide a reliable and convenient source of information about risks related to tree species and country of origin. The private sector can also play a vital role by pursuing and promoting best practices in due diligence, including but not limited to the use of digital traceability systems, wood ID testing,[128] and robust third-party certification.

DEEP DIVE

Seeing more than wood in the trees: increasing the value of responsible forestry through ecosystem services

GIJS BREUKINK,
SENIOR ADVISOR RESPONSIBLE FORESTRY, FORESTS FORWARD, WWF-NETHERLANDS

To preserve our forests, we need to recognize their multiple values and develop financial instruments that include the true total value of forest systems. Besides strict protection, we need to manage production forests sustainably – but for that to happen, incentives need to be in place.

WWF is working across its offices with forest managers who see more than wood in their forests and piloting approaches such as payments for ecosystem services that aim to increase the business case for responsible forestry.

NOT SEEING THE FOREST FOR THE TREES

More than half (54%) of the world's forests are managed either wholly or partly for production.[129] Many of these forests are managed unsustainably or are prone to degradation, which often leads to deforestation and conversion to other land uses.[130]

Sustainable forest management has led to considerable improvements in the way we regard and treat our production forests. Positive examples include improved inclusion in forest management decision-making processes, more set-aside areas alongside production units, and reduced levels of forest degradation in harvested forests – for instance through the implementation of reduced impact logging in tropical and pan-tropical forests.

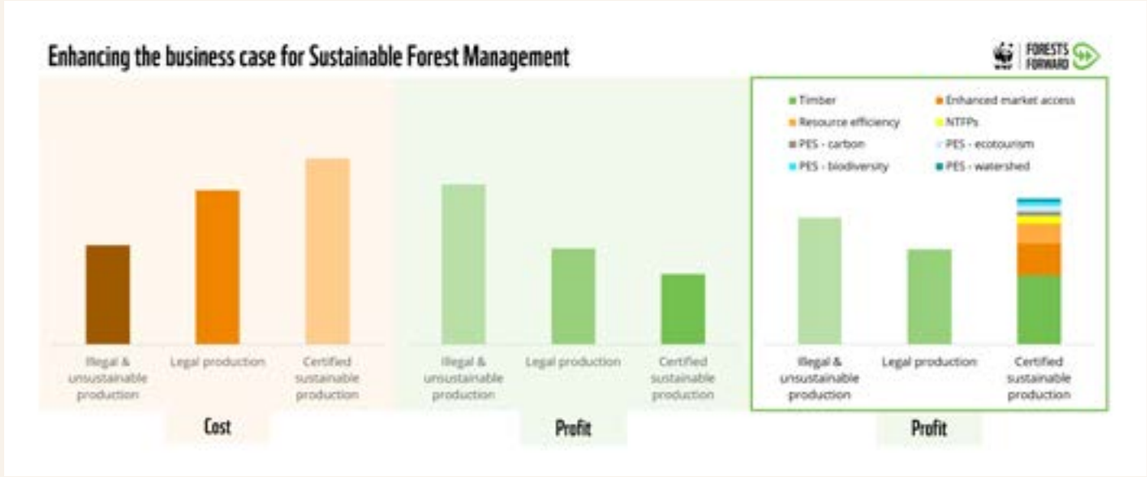
Progress towards an increase in sustainable forest management globally has been supported by the widespread presence of enabling frameworks and certification systems. However, such progress has been uneven, and the rate of forest loss is accelerating in tropical low-income countries where coverage by forest management plans remains low and forest certification insignificant.[131]

The sad truth of our time is that forest finance systems and harmful subsidies ensure that it is often more profitable to convert forests to other land uses (such as agriculture) than it is to manage them for preservation (e.g. through community or sustainable forest management). Furthermore, the production costs for certified operations are much higher than those that operate uncertified or informally [see Figure 7]. On top of this, there are few price premiums paid; everyone wants FSC-certified products, but no one wants to pay the real cost.

Today, only about 13% of the world's forests are certified.[132] If we want sustainable forest management and certification thereof to be a viable option for the majority of forests managed globally, we need to work on strengthening the business case for sustainable forest management.

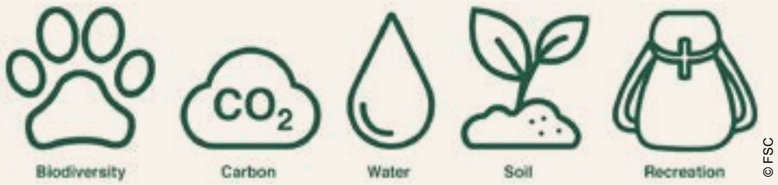
In order to incentivize the sustainable management of forest resources, a shift from a single-revenue approach to full-value forest management and stewardship is needed. Additional approaches include increasing access to markets, diversification of timber products, and expanding to non-timber forest products [see figure 7 below]. WWF's work is also showing that payments for ecosystem services can be a viable approach to pursue, and helps improve the business case for those that manage their forest resources responsibly.

Figure 7: Enhancing the business case for Sustainable Forest Management



PAYMENTS FOR ECOSYSTEM SERVICES

Ecosystem services[133] are the benefits that people obtain from nature. Forests provide society with a wide range of benefits, from reliable flows of clean water to productive soil and carbon sequestration. In FSC-certified forests, valuable ecosystem services are protected; in 2018, FSC introduced a procedure[134] to demonstrate and communicate the positive impact of responsible forest management on ecosystem services. It is also important to note that higher levels of ecosystem services are found in forests with more tree species.[135]



Types of ecosystem services

By verifying these positive impacts, the FSC Ecosystem Services certification aims to facilitate payments for ecosystem services and provide access to other benefits.[136] This aims to ensure that those who responsibly manage forests and those who take action to preserve forest ecosystem services get the increased business value they deserve.

THE FUTURE OF PAYMENTS FOR ECOSYSTEM SERVICES

Ecosystem services represent a topic of growing interest to companies, not only through a carbon lens but through a biodiversity lens too. Increasingly, companies are becoming aware that simple tree planting is insufficient to claim effective restoration of forest ecosystems, recognizing that forestry projects must go beyond "business as usual" to secure all the co-benefits that only a multifaceted project can provide. As such, WWF believes that payments for ecosystem services (PES) – including the support of concrete actions for the management and improvement of a forest's biodiversity and other services – is a viable pathway to enabling sustainable forest management at scale.[137]

We note that transitions to full-value sustainable forest management practices for our global forests are also going to be dependent on the full implementation of land tenure rights for the IPs and local communities whose practices are associated with better outcomes for forests across the tropics.[138]

We can't just capitalize on one ecosystem service, either; forests are multifunctional and provide so much more than wood or fixing carbon. So we also need to find ways of securing value for all of the ecosystem services forests offer. As with the pilot project examples [see boxes], WWF will continue to test and prove this concept with the aim of increasing the value of standing forests.

In order to take this work to scale, the following needs to be addressed:

- **Creating new funding opportunities** – Today the PES market mainly focuses on carbon projects. Funding from the private sector may increase if the PES market demonstrates more innovative and multifaceted projects that generate greater and more diverse benefits, particularly for biodiversity and carbon services. A better connection between the supply of payments and the supply of multiservice projects can occur in different ways, such as through a call for projects, the creation of a dedicated fund or market mechanisms (e.g. biodiversity credits), and others.
- **Capacity building** – There is genuine interest in the subject of carbon and biodiversity among companies, but to capitalize on this better education is needed on the role of ecosystem services and how to quantify and value them. For forest PES projects to be credible and risk-free, training must be provided to foresters and financiers. Those willing to set up PES initiatives must rely on financiers who understand the political, technical and financial benefits of the tool, plus forestry actors who understand the requirements of this new source of financing. Many FSC-certified forest managers have shown an interest in the Ecosystem Services procedure; some are already engaged and building experience.[139]
- **PES toolboxes** – The development of practical tools is needed to guide foresters on establishing projects that guarantee a benefit to the funder/buyer, to market projects, to calculate a payment on solid bases (additionality, validated methodologies), and to monitor and evaluate the benefits in a credible way.[140]


© Karine Aigner / WWF-US

BIODIVERSITY PROTECTION AND EMISSION REDUCTION IN A TROPICAL FOREST CONCESSION, REPUBLIC OF THE CONGO

Through its signature corporate engagement programme for forests, Forests Forward,[141] WWF is working with a forest concessionaire, Interholco, in the Congo Basin, to diversify its streams of income underpinning the sustainable management of its FSC-certified forests. Interholco is working to bring ecosystem services to market in the following ways:

Carbon: The forest concession is being managed according to reduced impact logging (RIL) principles and emission reductions are being assessed following the VERRA approved RIL-C methodology and set-aside methodologies.[142] The company aims to generate credits on the basis of the reductions realized and bring those to market.

Biodiversity: The forest was granted FSC Ecosystem Services certification for biodiversity, based on vast populations of great apes and forest elephants effectively protected within the concession and for maintaining forest integrity. Now, the company is seeking sponsors to increase biodiversity protection measures.

Payments for these services combined with the traditional business model (timber) will help companies such as these to serve as new models for multifunctional forest management.

More information

Investment opportunity


© James Morgan / WWF

CONNECTING ECOTOURISM AND BIODIVERSITY TO SUSTAINABLE FOREST MANAGEMENT IN ROMANIA

In Maramures, Romania, WWF is working with the Strâmbu Băiut Forest Directorate in a unique biodiverse mosaic landscape that includes a Natura 2000 site and UNESCO primeval forest. Together with local communities, they aim to better protect these areas and are exploring a payment for ecosystem services scheme to fund this conservation. The Forests Directorate received FSC Ecosystem Services certification for Recreation and Biodiversity:

Recreation: A local entity has been set up comprising the Forest Directorate, local community groups and WWF to develop ecotourism in the region, increasing the business case for sustainable forest management and improving local livelihoods.

Biodiversity: These forests are also home to some of the largest populations of large carnivores in Europe. The same entity is seeking investments to improve wildlife protection and promote human and wildlife coexistence. These two pathways are designed to create a diverse income stream and help create local employment[143].

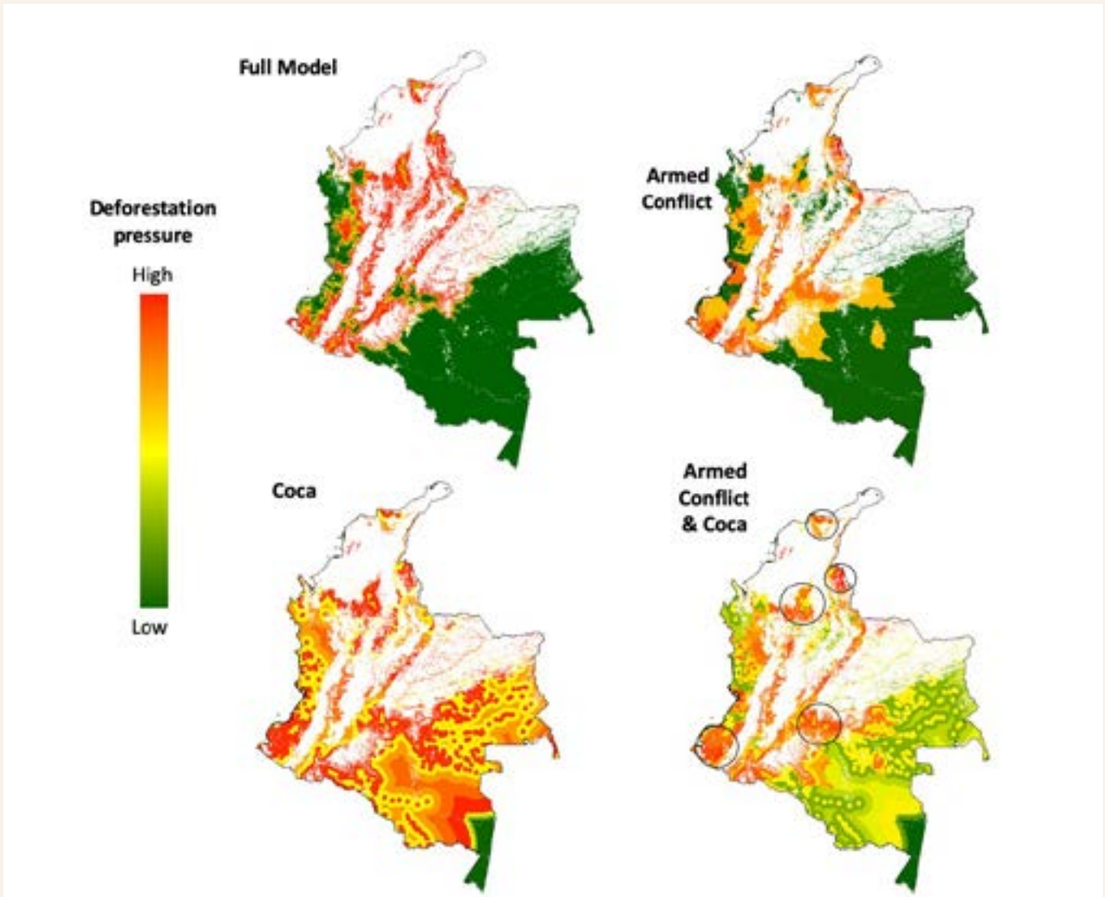
DEEP DIVE

Lessons from Colombia's forests

VERONICA ROBLEDO,
CONVERSION-FREE SUPPLY CHAIN TECHNICAL SPECIALIST
WWF-UK (WITH SUPPORT FROM WWF-COLOMBIA OFFICE)

More than half of Colombia's territory is covered by forests. Whether it's mangroves, humid tropical forests, dry forests, montane cloud forests or riparian forests, these precious ecosystems host over 55,000 flora and fauna species[144] and have been protected for hundreds years by IPs and local communities. However, Colombia has experienced a long internal armed conflict that has been mostly played out in its forests. Colombia's environmentally strategic forested territories have been under significant threat and impacted by degradation and deforestation due, among other factors, to the complex conflict dynamics.[145]

Map 1: Conflict and environment convergence in Colombia



Source: Pablo Negret for Mongabay Latam (2019)

DEFORESTATION AS A COMPLEX PHENOMENON

The drivers and underlying causes of deforestation in Colombia have been thoroughly documented in the past years. Colombia's environment and conflict history are intertwined. We cannot hope to understand one without the other, and this conflict-environment angle is slowly becoming better assessed and addressed by decision-makers and stakeholders, as well as receiving proper consideration in national[146] and international[147] media.

This shift in appreciating the country-specific context for Colombia's forests can set a valuable example for global forest goal instruments, such as the Forest and Climate Leaders Partnership (FCLP) country packages. A copy and paste approach to addressing forested nations' challenges will always hamper the success that we need in order to meet the globe's forest goals, one nation at a time.

Colombia's foregrounding of its own unique context has been crucial in the efforts to address deforestation in the country, which have already resulted in effective action, with deforestation rates across the country finally decreasing.[148]

The conflict-environment context has also contributed to a more nuanced and comprehensive analysis of drivers and underlying causes of deforestation, as some dynamics are misleading if considered out of the conflict context.

DEFORESTATION DRIVERS, HIDDEN IN PLAIN SIGHT

Traveling across Colombia to witness deforestation hotspots, direct drivers are all too evident. Large-scale clearance for cattle-ranching pastures, often of low and inefficient productivity, is easily visible; as is poorly planned infrastructure development, and expansion of the agricultural frontier. But these visible landscape systems disguise bigger underlying causes. Cattle ranching in some Amazon states for example (given it is the main cause of deforestation in Colombia and is responsible for more tree loss than coca, illicit logging or illegal gold mining)[149] is actually camouflaging other more significant factors: land grabbing, historical processes of colonization, armed conflict, and narco-trafficking.[150]

To describe deforestation and degradation in tropical forested nations internationally, as we so often do, without acknowledging this all-too-common foundation of internally and externally driven socioeconomic pressures, sets us on a path to failing to address the drivers of forest loss, before we have even attempted to intervene in them.

COLOMBIA'S POST PEACE AGREEMENT FORESTS

Since the Peace Agreement in 2016, Colombia has suffered an exponential peak in forest loss due to transformation of land mainly for cattle pasture.[151] The Peace Accords, although a positive step towards a peace-building process for the country, also ended a long-lasting mandate from the Revolutionary Armed Forces of Colombia (commonly known as FARC) to control territories through the protection of forests. Since then, and due to a lack of strong state presence and rule of law, other insurgents and criminal groups have taken advantage of that political vacuum and a new economic opportunity to position their operations for new land-use activities such as land grabbing and extensive unsustainable cattle ranching systems. Various studies have found an increase in the deforestation rate both within protected areas and associated buffer zones in the years following Colombia's peace agreement.[152]

In the post-agreement years, land has also been cleared by these groups for coca growing, laundering money, illegal gold mining and logging.[153] An understanding of the complex dynamics of illicit activities is critical when aiming to design effective solutions to tackle deforestation.

Adding to these complexities, many displaced communities and conflict victims have been forced to clear land for remunerative uses and seek livelihood options in remote forested areas (many of those inside forest reserves of National Natural Parks).[154] In other areas, deforestation has been incentivized by cultural perceptions of local development, as forests are sometimes perceived as obstacles to economic growth, and an impediment to improved social status, which culturally in some communities can be defined by the amount of cattle you possess or the area of cleared land you own.[155] Moreover, for several communities across the country, clearing forests has been falsely perceived and legally misinterpreted as a route to obtain land rights of vacant territories.[156] So whether deforestation is caused by illicit, informal or legal avenues, it highlights how important it is to assess this phenomenon considering demographic, economic, political, institutional and cultural factors.

THE ROAD TO SUCCESS

So how does civil society operate in such a complex and dynamic post-conflict environment to achieve the aims of conservation?

For over four decades, WWF-Colombia has been one of the leading organizations in the country supporting the transformation of social and economic systems across forested areas. An inclusive approach has proven how conservation models and community-based forest governance can become an empowerment tool for communities to guarantee sustainable economic alternatives and multiscale comprehensive actions (like the FLEGT project (Forest Law Enforcement, Governance and Trade) that WWF has led with the Colombian government and main donor embassies which also strengthened regulatory frameworks to address main deforestation drivers).

Projects such as “Strengthening Forest Governance in Colombia”[157] have strengthened capacities of 150 families in local communities in key forested regions through valuing standing forests. This approach has secured around 4,000 hectares of sustainably used forests through the development of supply chains for non-timber forest products such as acai, cacay, cacao, moriche and jagua, and a responsible use of legally sourced timber.

The organization has also established bottom-up processes for effective local governance such as a national network of community-based monitoring, sharing practices and lessons learned between communities experiencing deforestation in different areas of the country. One of the most recognizable legacies of WWF in this agenda has been the support provided to IPs and local communities in all five regions ofColombia to develop a robust and inclusive framework for social and environmental safeguards for REDD+ projects.[158] With financial institutions, agro-industrial corporations and retailers, WWF-Colombia has established strategic partnerships to support those sectors to incorporate forest and climate criteria into their policies and portfolios. Through their national policy advocacy efforts, they have been able to contribute to some of the most innovative financial mechanisms like the recently approved GCF-WWF Heritage Colombia programme[159] led by National Natural Parks and the Ministry of Environment in Colombia, a US$145 million public-private effort that will secure financing in perpetuity for the sustainable management of key ecosystems, avoiding 46 million tonnes of emissions and benefiting almost 17 million people in Colombia.

As for conflict-environment approaches, WWF-Colombia, alongside peace and environment partners, has widely reported the dangers that environmental defenders face daily when tackling deforestation,[160] and has been one of the leading organizations tackling the impacts of mining in the most affected region in Colombia,[161] and in the country’s adhesion to the Escazu’s Agreement. The latter has resulted in 13 new policy instruments, 3,000 people trained in sustainable management of forests, the declaration of four new protected areas (covering 500,000 hectares), eight municipalities with new territorial planning processes, and more than US$1 million in sales of 15 businesses that are low deforestation risk. Currently, the office is leading the creation of an Amazon Alliance to reduce the impacts of gold mining and associated illegal activities in the region.[162]

As for cattle ranching,[163] WWF-Colombia has partnered with the UK government and the biggest retailer company in Colombia, Grupo Exito, to build new business models for sustainable cattle ranching systems and contribute to a more transparent and traceable beef supply chain. WWF has also supported projects across the country for ranchers to transform their inefficient cattle ranching systems to silvopasture approaches. Finally, by securing a strong and long-lasting partnership with the Colombian government, WWF-Colombia is directly contributing to President Petro’s new Contention Plan Against Deforestation,[164] and to the reestablishment of environmental rule of law in deforestation hotspots and conflict-affected areas.

LESSONS TO CONSIDER – HOW CAN THE COLOMBIAN CASE CONTRIBUTE TO THE FCLP PROCESS?

Peacebuilding as a way to tackle deforestation

There is now a detailed warfare ecology literature that speaks to the complex positive and negative indirect impacts of conflict on nature and biodiversity around the world.[165] With armed conflict having occurred in more than 60% of the world’s biodiversity hotspots over recent decades,[166] ignoring the conflict context when considering our future forests is likely to hamper success.

Colombia’s approach to addressing deforestation through the construction and strengthening of social and environmental dialogues with IPs and local communities instead of heavily militarized and securitized interventions is one of the critical lessons learned that FCLP membership can consider when designing and/or supporting country packages where conflict dynamics are a driver. Understanding deforestation as a socio-environmental process that takes place both inside and outside the forests, rather than simply as a biophysical process or security matter,[167] will allow initiatives to be designed considering cultural identity and people’s livelihoods, as well as political intricacies and conflict dynamics (which vary widely depending on the region).

Connectivity at the center

Colombia has seen increasing and significant attention paid to its Amazon forests in recent years. This region has now become a competitive ground for donor funding and other public/private resources. Although it is positive to see finance flowing to this important biome, this has also resulted in fragmented and duplicative interventions on the ground that can overwhelm communities and hinder long-term sustainability.

Interested interventions should keep in mind:

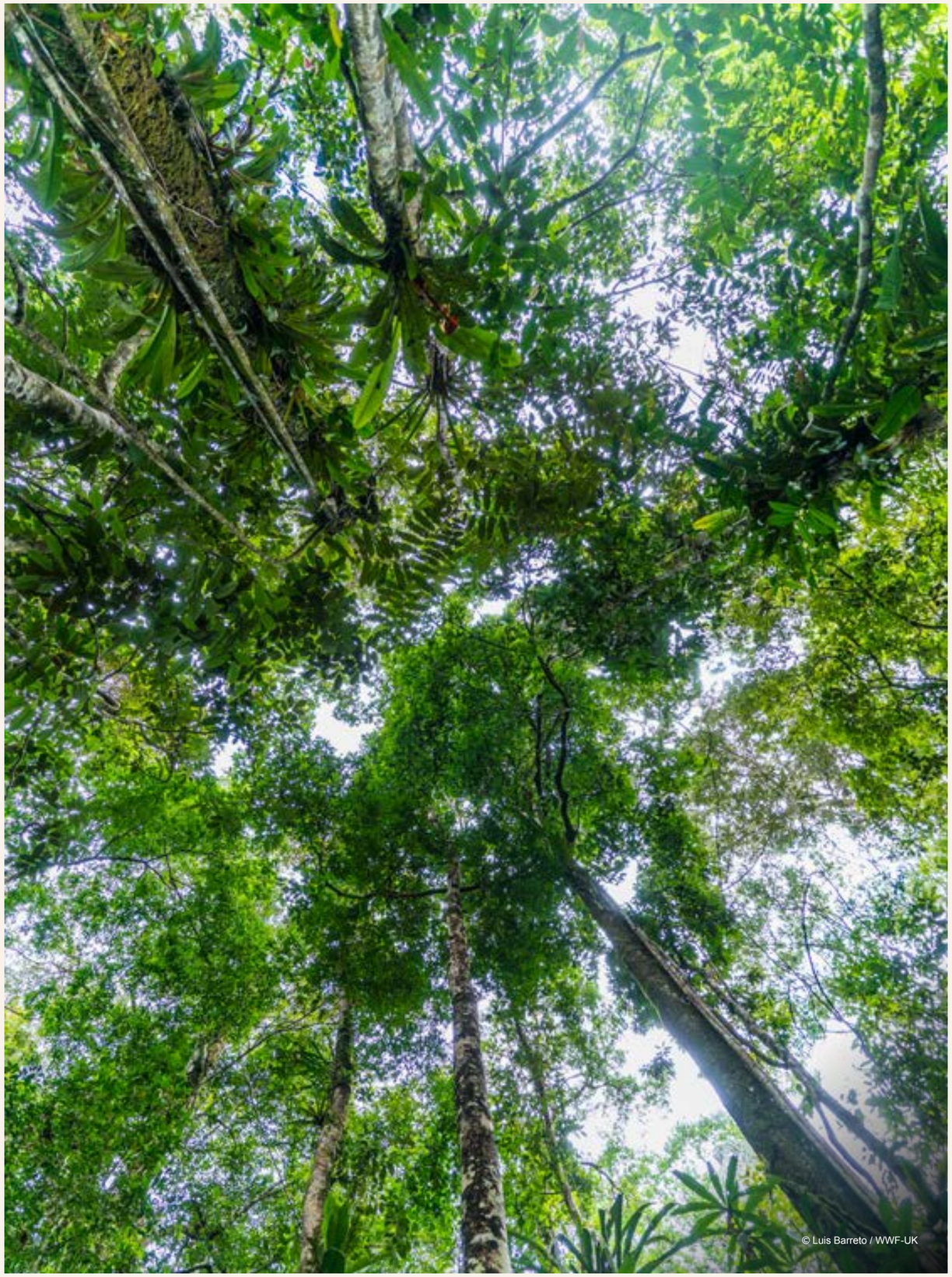
1. **Connectivity with other key ecosystems** – As mentioned above, Colombia is a country with a variety of forests, and the high attention paid to the Amazon forests has neglected efforts in other key environmental and biodiversity regions where deforestation, conversion of non-wooded land, and conflict dynamics are exacerbated (like the tropical forests in the Pacific region, or the flooded savannas and riparian forests in the Orinoquia region). When investing in the Amazon region, it is key to understand how this connects to existing initiatives, and how this can impact other forest states or buffer ecosystems, as this lack of comprehensive approaches can lead to deforestation leakage. Building capacities through skillshares and lessons learned from communities in different forest states within a country[168] and between conflict-affected countries is a positive step towards transformational action (maximize impact of traditional knowledge, best practices and peacebuilding processes).

2. **Connectivity between forests and cities** – As many of the solutions promoted for sustainable livelihoods rely on the development of supply chains and markets for non-timber forest products and sustainable timber products, or ecotourism projects, the prosperity of those will depend on how well connected they are to nearby urban centers and main commercial cities across the country.[169] The lack of infrastructure, access to markets, public services, traceable supply chain systems, and rule of law hinders the possibility of those communities to secure a sustainable and competitive economic alternative. More attention needs to focus on those urban settlements and their market dynamics and differentials, as this is where most of the population in those areas live. So interventions should acknowledge this economic geography, and embrace the role of cities and intermediary urban settlements in forest protection and sustainable use.

International leadership

Colombia has historically been a leading country in international environmental and sustainability frameworks. As one of the founding countries of the SDGs agenda, and a key leader under the AILAC Group under UNFCCC, Colombia has promoted an active and constructive participation for the achievement of the 2030 goals. It was the first nation to achieve the 30x30 goal, and it holds one of the greenest and most inclusive Constitutions in the world.

Even if this still has significant gaps when translated into local action (as Colombia is still one of the most unequal countries in the world, and fragmented armed groups have been surging across all regions of the country), Petro's new government represents a key political opportunity in the predominantly left-wing movement of governments in South America to drive the needed change for more environmental ambition. The recent Amazon Summit joint statement reaffirmed the role of *forests as centers of sustainable development and sources of solutions*, and Colombia could play a role in leading by example translating this into a robust and comprehensive country package that can inspire other countries under the FCLP framework.



CONCLUSIONS AND RECOMMENDATIONS

What needs to happen to protect, restore and sustainably manage forests? We outline principles to guide forest decisions.

1. Global climate, forest and sustainable development goals are intertwined. If we are committed to our climate and sustainable development goals then we must make good on our forest commitments.

2. Sufficient finance must flow to forests, Indigenous Peoples and local communities. Collaboration and coordination between forest-rich and donor nations and the private sector should steer this finance flow.

3. Meeting forest goals requires strong implementation, accountability and robust tracking of targets. Goal tracking should fully and transparently track pledged finance.

4. Public finance should be used smartly to leverage private finance; this should be part of the progress tracking of international forest commitments. Biodiversity and carbon markets can catalyse finance for forests, but they are not a panacea, and need reforming to be useful at scale.

5. Smarter forest finance must be delivered at pace, scale and justly to local actors, in ways which take into account individual forested nation contexts, alongside investment to support green economic pathways. We need innovation in this space, scaling financial mechanisms that are working, and finding new financial instruments that can be activated quickly.

6. Repurposing of subsidies that are harming forests has to begin in earnest (in line with Target 18 of the Global Biodiversity Framework), ensuring that that funding is delivered to forests and to support sustainable agriculture and food systems.

7. We must recognize and deliver land tenure rights for all Indigenous Peoples and local communities, at an accelerated speed. Rights delivery must be supported by strengthened self-governance systems, empowered institutions and appropriate recognition, as forest partners and stewards.

8. The knowledge, practices and actions of Indigenous Peoples and local communities, who contribute to protecting forests, must be recognized, respected and valued. When rights have been delivered Indigenous Peoples and local communities should also be supported to realize those rights through facilitating access to markets, finance, legal protection and technologies. Their rights must be secure.

9. Reductions in illegal logging, management, trade, and overexploitation (of products, timber and wildlife) must be enabled by equitable protection and effective law enforcement on all axes.

10. Multiple forest value systems must be recognized, beyond carbon storage, conversion potential and economic asset. Our forest management and trade systems must recognize all that forests do for people, nature and climate.

11. We must see national commitments to ambitious and full implementation of the Global Biodiversity Framework, and ensure the target to reduce the global footprint of consumption includes national and import-based footprints. This target must be translated into national objectives and actions within updated National Biodiversity Strategies and Action Plans (NBSAPs), including numerical footprint targets.[170]

12. Commodity supply chains must be deforestation and conversion-free, be rights-based, and must not allow spillover of conversion to other (e.g. grassland and savannah) ecosystems.

13. Deforestation and conversion-free import regulations need to be fully implemented, and to recognize that importer countries also have responsibility for greenhouse gas emissions from deforestation and conversion embedded in traded goods. These recognitions cannot fully be served under existing frameworks such as the UNFCCC. Current UNFCCC national carbon accounting procedures define producer countries as responsible for these emissions. However, embedded emissions should also be defined in the NDC targets and implementation plans of importing nations. We ask that Nationally Determined Contributions, under UNFCCC reporting processes, include assessments of deforestation and degradation-embedded emissions, especially related to agriculture.

14. Increasing pressure from infrastructure development and extractive activities needs to be tackled through participatory, integrated and biodiversity-inclusive spatial planning as outlined under Target 1 of the Global Biodiversity Framework, together with robust strategic environmental assessments.

PATHWAYS:

- **Accelerating** the recognition of Indigenous Peoples and local communities' right to own and manage their lands, territories and resources – realizing, respecting and permanently securing those rights.
- **Mobilizing** massive financial flows, both public and private, and repurposing harmful ones to support green and sustainable forest economies and trade.
- **Reforming** the rules of global trade that harm forests, getting deforesting commodities out of global supply chains, and removing barriers to forest-friendly goods.
- **Shifting** towards nature-based and bio economies.

CONCLUSIONS

We are at a major turning point with irreversible consequences. Climate change and the drivers of forest conversion and degradation are currently in charge of our forests' future, but they do not have to be. What is needed now is for gaps in the accountability and implementation of global forest commitments to be filled, greater finance where it is needed, repurposing and scaling up where finances and instruments to deliver already exist, if we are to get on track to meeting global forest commitments.

The pathways, however, have a sequence; mobilizing, reforming and shifting finances and global trade systems will only deliver for forests once those forests are under the stewardship of those who hold secure rights to own and manage their land, territories and resources, free from the impacts of illegality. Accelerating the recognition of rights to Indigenous Peoples and local communities and realizing them, securely and permanently, underpins all the other pathways to meeting forest goals. We can acknowledge that transitions are difficult, but we must abandon pathways that have not worked to protect forests, and expand what is working.

Year on year we are failing to make progress towards global forest goals. Where systems of financing, governance, stewardship and management are making gains, they are not enough to push against the continuing incentivization of forest conversion, and forest-harming subsidies. We face a sustainable forest funding gap that could amount to hundreds of billions of dollars every year. The risks that come with these failures threaten people, nature and our climate stability.

A fundamental shift is needed in how we value forests, one which recognizes the multiple values that forests have for people, nature and climate. The forest value system we are currently driven by, which prioritizes the conversion of forest to other land uses over the protection and sustainable management of standing forest, is associated with our continued failures to meet global forest goals.

There is more opportunity than risk in a move away from single-value foci for forests, in which they are either valued for their carbon, or as having greater value converted to agriculture, to one in which the multiple values of forests govern the decisions we make and how we fund commodities practices.

Forested nations need a fair share of forest finance to protect their standing forests. The packages that deliver this support need to use appropriate existing financial instruments, but also develop innovative ways of financing where needed. The international actors that preside over trade and financial flows from major tropical forests need to become the sustainable changemakers halting primary tropical forest conversion and degradation and delivering sustainable forest management and deforestation and conversion-free production and trade.

Forests need a future in which $100s of billions per year in harmful subsidies stop and become part of the $460bn needed in investment in sustainable forest and food economies, in which we move from isolated project-scale voluntary carbon market activity, to jurisdictional scale, verified systems of carbon and biodiversity finance, from supply chains underpinned by illegality and encroachment into Indigenous territories to tenure rights to the 30% of forests in unrecognised Indigenous Territory stewardship, and from global trade systems that cannot deliver protected, restored and sustainably managed forests to ones that can.

© Shutterstock / Gustavo Frazao / WWF

We do not need any more forest goals. What we need is to start implementing the ones we have justly, with ambition, and at pace, growing positive momentum in both the public and private sectors.

Our call to action is for governments and businesses to get on track, make good on their public commitments to halting forest loss, protecting, sustainably managing, and restoring forests and to start making continuous and meaningful annual progress towards our forest goals. We expect businesses and governments to step up at COP28 and outline how they will deliver their commitments.

© Jody MacDonald / WWF-US

ANNEX 1

METHODS

COMMODITY FOOTPRINTING

Estimating the quantity of imports and consumption

The methods for estimating quantities of imports and exports and their land footprint follows the approach used for similar studies, including the UK,[171] Belgium,[172] Denmark,[173] France[174] and Switzerland,[175] the Netherlands,[176] and for one sub-national study in Wales.[177]

Import data from the UN COMTRADE database[178] was used to estimate the quantity (net weight) of imports for 2021. We chose this database because it allows a similar method to be replicated for other countries, giving us a global comparable overview of trade flows. As all of the commodities are exported as co-products (e.g. soy beans, soy meal, and soy oil), net weights were converted into "whole commodity equivalents" using conversion factors from the technical literature.[179]

Given the global nature of this work, and unlike the studies cited above, only raw and semi-processed commodities were included, not those as an ingredient or component in manufactured products (e.g. palm oil embedded in processed food) or those embedded in exports as part of the upstream production process (e.g. soymeal used in pig feed embedded in exported pig products). See Table A for lists of the commodity co-products included within this analysis.

All countries that were responsible for at least 3% of global exports and 3% of global imports are included in the analysis. This covers the majority of global exports and imports for all of the commodities (Table B). Although a significant amount of trade is conducted by third-party countries, this was not assessed here. In part that is because the EU is treated as a single trading block, which significantly reduces the amount of intermediate trade (the "Rotterdam effect"), and partly because sensitivity analysis showed that doing so would provide limited additional information for analysis of this scope.

Table A: Commodity co-products included in the analysis

COMMODITY	HS CODE	COMMODITY
Soy	1201	Soya beans; other than seed, whether or not broken
	1507	Soya-bean oil and its fractions; whether or not refined, but not chemically modified
	2304	Oil-cake and other solid residues; whether or not ground or in the form of pellets, resulting from the extraction of soya-bean oil
Palm oil	1511	Palm oil and its fractions; whether or not refined, but not chemically modified
	151321	Vegetable oils; palm kernel or babassu oil and their fractions, crude, not chemically modified
	151329	Vegetable oils; palm kernel or babassu oil and their fractions, other than crude, whether or not refined, but not chemically modified
	230660	Oil-cake and other solid residues; whether or not ground or in the form of pellets, resulting from the extraction of palm nuts or kernels oils
Cocoa	1801	Cocoa beans; whole or broken, raw or roasted
	1802	Cocoa; shells, husks, skins and other cocoa waste
	1803	Cocoa; paste; whether or not defatted
	1804	Cocoa; butter, fat and oil
	1805	Cocoa; powder, not containing added sugar or other sweetening matter
Coffee	90111	Coffee; not roasted or decaffeinated
	90112	Coffee; decaffeinated, not roasted
	90121	Coffee; roasted, not decaffeinated
	90122	Coffee; roasted, decaffeinated
	90190	Coffee; husks and skins, coffee substitutes containing coffee in any proportion

Table B: Proportion of global exports and imports accounted for by countries exporting and importing at least 3% of global trade

COMMODITY	EXPORTERS	IMPORTERS
Soy	86%	57%
Oil palm products	88%	65%
Cocoa	77%	67%
Coffee	55%	58%

Estimating the footprint of imports

Estimating the land area required to produce the quantities of commodities exported is straightforward, as yield data is readily available.[180] The yield for each country, each year, was used to convert the imported volumes into an estimated land area required for production, i.e. land footprint.

Estimation of GHG from land-use change

The Land Use Change Impact Tool[181] was used to estimate commodity-specific per-hectare CO_2e emissions for soy, cocoa, coffee, coconut, palm oil and maize.

The tool allows emissions from land-use change to be assessed when the country of production is known, but the exact parcel of land used to produce the crop is unknown. This matches the level of detail of our provenance calculations which is determined by the available data. For this scenario, the tool uses an indirect approach to calculating emissions from land-use change (LUC), based on the relative rates of crop expansion at the expense of different previous land uses in a country. It uses FAO data on direct LUC (i.e. deforestation, conversion and crop-to-crop change) associated with a crop in a certain country and divides by the total expansion of the same crop in the country, assigning a rate of LUC (and therefore GHG emissions) per hectare of crop expansion.

Crop expansion is calculated for each year by comparing the average harvested area of the crop in the three most recent years for which data is available to the average of three years 20 years ago. For each subsequent year, this "baseline" will therefore shift or move up by a year and data on LUC in a specific year is not counted in subsequent years. The associated emissions per hectare are then calculated based on methods consistent with the Intergovernmental Panel on Climate Change (IPCC)[182] and the PAS 2050-1 framework,[183] including "amortization" so that the total emissions from the 20-year period of the LUC are apportioned equally over the 20 years (see tool's methodology for further details).

The commodity-specific per-hectare CO_2e emissions was then multiplied by the importing countries' land footprints per commodity in each producer country to estimate the GHG emissions associated with LUC per country, for each crop.

The method does not allow for GHG estimates for specific parcels of land, due to the lack of primary data at the necessary level of spatial detail. The figures used are therefore averaged for entire countries, meaning it is not possible to distinguish regional variations in emissions or assign deforestation to a specific piece of land. The values are therefore an indication of the risks of deforestation/land conversion and GHG emissions associated with the Netherlands' imports of such commodities.

Comparison of GHGs embedded in exports to national GHG inventories

The GHG estimations from land-use change (described above) were compared with total emissions (including LULUFC) reported to the UNFCCC.[184] UNFCCC reporting procedures mean that different countries have different reporting schedules, largely depending whether they are Annex 1 (industrialized countries that were part of the OECD in 1992) or Annex 2 countries. The most recent data recorded on Climate Watch for each of the producer countries is given in Table C.

Table C: UNFCCC national GHG inventory dates used

COUNTRY	LATEST UNFCCC DATA AVAILABLE
Argentina	2012
Brazil	2016
Canada	2019
China	2014
Colombia	2004
Côte d'Ivoire	2000
Ecuador	2012
Ethiopia	2013
Ghana	2006
Guatemala	2005
Indonesia	2000
Lao PDR	2000
Malaysia	2011
Myanmar	2005
Nigeria	2000
Thailand	2013
Uganda	2000
Ukraine	2019
United States	2019
Uruguay	2019
Viet Nam	2013

The methods used to estimate GHGs from land-use change here and in national GHG inventories are different, as are the dates for which emissions are estimated. The two sets of data are therefore not directly comparable. However, they do provide a general picture of the likely importance of emissions embedded in trade to producer country emissions.

NDCs

All producer country NDCs were assessed for the way in which they covered emissions from land-use change, and their treatment of deforestation, according to the categories shown in Table 7. NDCs are available from the UNFCCC NDC Registry.[185]

REFERENCES

Forest Declaration Assessment Partners. 2023. Forest Declaration Assessment. Climate Focus (coordinator and editor), and references therein. Accessible at www.forestdeclaration.org

1 Rights and Resources Initiative. 2014. *What Future for Reform? Progress and slowdown in forest tenure reform since 2002*. Washington DC: Rights and Resources Initiative.

2 ibid.

3 WWF, UNEP-WCMC, SGP/ICCA-GSI, LM, TNC, CI, WCS, EP, ILC-S, CM, IUCN. 2021. *The State of IPs' and Local Communities' Lands and Territories: A technical review of the state of IPs' and Local Communities' lands, their contributions to global biodiversity conservation and ecosystem services, the pressures they face, and recommendations for actions*. Gland, Switzerland.

4 Garnett, S.T., Burgess, N.D., Fa, J.E. et al. 2018. A spatial overview of the global importance of Indigenous lands for conservation. *Nature Sustainability* **1**: 369-373.

5 Sobrevila, C., 2008. *The Role of IPs in Biodiversity Conservation: The Natural but Often Forgotten Partners*. The World Bank, Washington DC.

6 Walker, W.S., Gorelik, S.R., Baccini, A., Aragon-Osejo, J.L., Josse, C. et al. 2020. The role of forest conversion, degradation, and disturbance in the carbon dynamics of Amazon Indigenous territories and protected areas. *PNAS* **117** (6): 3015-3025

7 Sze, J.S., Carrasco, L.R., Childs, D. and Edwards, D.P., 2022. Reduced deforestation and degradation in Indigenous Lands pan-tropically. *Nature Sustainability* **5** (2): 123-130.

8 Rights and Resources Initiative, World Resources Institute, and Woods Hole Research Center. 2018. *Toward a Global Baseline of Carbon Storage in Collective Lands; An Updated Analysis of IPs' and Local Communities' Contributions to Climate Change Mitigation*. Washington DC: RRI.

9 Ding, H., Viet, P.G., Blackman, A., Gray, E., Reytar, K., Altamiro, J.C. and Hodgson, B. 2016. *Climate Benefits, Tenure Costs: The Economic Case for Securing Indigenous Land Rights in the Amazon*. World Resources Institute, Washington DC, WRI.

10 FAO and FILAC. 2021. *Forest governance by Indigenous and tribal peoples. An opportunity for climate action in Latin America and the Caribbean*. FAO, Santiago.

11 Berkes, F., Folke, C.and Colding, J. (eds.) 1998. *Linking social and ecological systems: management practices and social mechanisms for building resilience*. Cambridge University Press. New York.

12 Kennedy, C.M., Fariss, B., Oakleaf, J.R., Garnett, S.T., Fernández-Llamazares, A. et al. 2023. IPs' lands are threatened by industrial development; conversion risk assessment reveals need to support Indigenous stewardship. *One Earth* **6** (8): 1032-1049.

13 Agrawal, A., Chhatre, A. and Hardin, R. 2008. Changing governance of the world's forests. *Science* **320** (5882): 1460–1462; Pacheco, P., Mo, K., Dudley, N., Shapiro, A., Aguilar-Amuchastegui, N., et al. 2021. *Deforestation fronts: Drivers and responses in a changing world*. WWF, Gland, Switzerland.

14 Soares-Filho, B.S., Oliveira, U., Ferreira, M.N., Marques, F.F.C, de Oliveira, A.R. et al. 2023. Contribution of the Amazon protected areas program to forest conservation. *Biological Conservation* 279.

15 Fairhead, J., Leach, M. and Scoones, I. (2012), 'Green Grabbing: A New Appropriation of Nature?', *Journal of Peasant Studies* 39 (2), pp. 237–61.

16 Rights and Resources Initiative, 2020. *Rights-Based Conservation: The path to preserving Earth's biological and cultural diversity?* Washington DC.

17 ICCA Consortium. 2021. *Territories of Life: 2021 Report. ICCA Consortium: worldwide*. Available at: report.territoriesoflife.org.

18 Garnett, S.T. et al. 2018. Op cit.

19 https://apibocial.org/2022/11/16/on-urgent-protection-of-the-cerrado-and-the-other-natural-ecosystems/?lang=en

20 Rights and Resources Initiative. 2015. Op cit.

21 Differences in IP and LC territory area amounts can arise, depending if they refer to land area, forest area, land and inland water areas; or report on IP and LC or IP territories only.

22 Garnett, S.T. et al. 2018. Op cit.

23 Fa, J.E., Watson, J.E.M., Leiper, I., Potapov, P., Evans, T.D. et al. 2020. Importance of IPs' lands for the conservation of Intact Forest Landscapes. *Frontiers in Ecology and the Environment* **18** (3): 135-140.

24 Nepstad, D., Schwartzman, S., Bamberger, B., Santilli, M., Ray, D. et al. 2005. Inhibition of Amazon deforestation and fire by parks and Indigenous lands. *Conservation Biology* **20** (1): 65-73.

25 Dawson, N.M., Coolsaet, B., Sterling, E.J., Loveridge, R., Gross-Camp, N.D. et al. 2021. The role of IPs and local communities in effective and equitable conservation. *Ecology and Society* **26** (3): 19.

26 Qin, Y., Xiao, X., Liu, F., de Sa e Silva, F., Shimabukuro, Y. et al. 2023. Forest conservation in Indigenous territories and protected areas in the Brazilian Amazon. *Nature Sustainability* **6**: 295-305.

27 Camino, M., Arriaga Valesco Aceves, P., Alvarez, A., Chianetta, P., de la Cruz, L.M. et al. 2023. Indigenous lands with secure land tenure can reduce forest-loss in deforestation hotspots. *Global Environmental Change* **81**: 102678.

28 Sze, J.S., Carrasco, L.R., Childs, D. et al. 2022. Reduced deforestation and degradation in Indigenous Lands pan-tropically. *Nat Sustain* 5, 123–130. https://doi.org/10.1038/s41893-021-00815-2

29 Dudley, N., Bhagwat, S., Higgins-Zogib, L., Lassen, B., Verschuuren, B. and Wild, R. 2010. Conservation of Biodiversity in Sacred Natural Sites in Asia and Africa: A Review of the Scientific Literature. In: Verschuuren, B., Wild, R., McNeely, J. and Oviedo, G. (eds.) *Sacred Natural Sites: Conserving Nature and Culture*. Earthscan, London: 19-32.

30 Shahbuddin, G. and Rao, M. 2010. Do community-conserved areas effectively conserve biological diversity? Global insights and the Indian context. *Biological Conservation* **143** (12): 2926-2936.

31 Boedihartono, A.K. 2017. Can Community Forests Be Compatible With Biodiversity Conservation in Indonesia? *Land*, Special Issue **6**: 21.

32 Sayer, J., Margules, C. and Boedihartono, A.K. 2017. Will Biodiversity Be Conserved in Locally-Managed Forests? *Land* **6** (1): 6.

33 McGee, G., Cullen, A. and Gunton, T. 2010. A new model for sustainable development: A case study of the great bear rainforest regional plan. *Environment, Development and Sustainability* **12** (5): 745-762.

34 Krauss, C. 2006. Canada to Shield 5 million forest acres. *The New York Times*.

35 Low, M. and Shaw, K. 2012. Nations Rights and Environmental Governance: Lessons from the Great Bear Rainforest, *BC Studies* **172**: 9-33.

36 WWF. 2015. *Project Finance: Key Outcomes and Lessons Learned*. WWF-US, Washington DC.

37 https://www.cbd.int/gbf/introduction/

38 Arias-Bustamante, J.R. and Innes, J.L. 2021. Adapting forest management to climate change: experiences of the Nisga'a people. *International Forestry Review* **23** (1): 1-15.

39 Kennedy, C.M., Fariss, B., Oakleaf, J.R., Garnett, S.T., Fernández-Llamazares, Á. et al. 2023. IPs' lands are threatened by industrial development: conversion risk assessment reveals need to support Indigenous stewardship. *One Earth* **6**: 1-18.

40 https://www.conservation.org/priorities/exponential-roadmap-natural-climate-solutions, https://bteam.org/our-thinking/news/reform-1-8-trillion-yearly-environmentally-harmful-subsidies-to-deliver-a-nature-positive-economy, https://justruraltransition.org/pac/

41 IPCC. 2023. https://www.ipcc.ch/srccl/chapter/chapter-5/; Designing Fiscal Instruments for Sustainable Forests, CIF 2021, p. 261.

42 Koplow, D. and Steenblik, R. 2022. Op cit; FAO State of the Forest Report 2022, Rome.

43 Forest Declaration Assessment Partners. 2023. Forest Declaration Assessment. Climate Focus (coordinator and editor). Accessible at www.forestdeclaration.org.

44 Forest Declaration Assessment 2022. https://www.forestdeclaration.org/resources/forest-finance-theme-3-assessment

45 Ding H., Markandya, A., Barbieri, R., Calmon, M., Cervera, M. et al. 2021. *Repurposing Agricultural Subsidies to Restore Degraded Farmland and Grow Rural Prosperity*. World Resources Institute, Washington DC.

46 Classen, A., Peters, M.K., Ferger, S.W., Helbig-Bonitz, M., Schmack, J.M. et al. 2014. Complementary ecosystem services provided by pest predators and pollinators increase quantity and quality of coffee yields. *Proceedings of the Royal Society B* **281:** 20133148; Hamilton, L. 2008. *Forests and water*. FAO Forestry paper 155. FAO, Rome; Renaud, F.C., Sudmeier-Rieux, K. and Estrella, M (eds.) 2013. *The Role of Ecosystems in Disaster Risk Reduction*. United Nations University Press, Tokyo, New York, Paris; Stolton, S., Dudley, N. and Randall, J. 2008. *Natural Security: Protected areas and hazard mitigation*. WWF, Gland, Switzerland.

47 Sunderland, T.C.H., Powell, B., Ickowitz, A., Foli, S., Pinedo-Vasquez, M. et al. 2013. *Food Security and Nutrition: The role of forests*. Discussion paper. CIFOR, Bogor Indonesia; Vira, B., Wildburger, C. and Mansourian, S. (eds.) 2015. *Forests and Food*. Open Books Publishers, Cambridge, UK.

48 Pendrill, F., Gardner, T.A., Meyfroidt, P., Persson, U.M., Adams, J. et al. 2022. Disentangling the numbers behind agriculture-driven tropical deforestation. *Science* **377** (6611).

49 CIF. 2021. *Designing Fiscal Instruments for Sustainable Forests*. World Bank Group, Washington DC.

50 Damania, R., Balseca, E., de Fontaubert, C., Gill, J., Kim, K. et al. 2023. *Detox Development: Repurposing Environmentally Harmful Subsidies*. World Bank, Washington, DC.

51 See also Ding et al. 2021. WRI.

52 Damania, R. et al. 2023, Op cit; Gautam, M., Hayde, E. and Zhang, Y. 2021. Agricultural subsidies and forests. In: *Designing Fiscal Instruments for Sustainable Forests*. The World Bank Group, Washington DC.

53 Ibid.

54 https://www.cbd.int/gbf/targets/18/

55 The Just Rural Transition Initiative is a group that brings together food producers, governments, businesses, investors, civil society, rural and IPs to champion equitable solutions to food systems, see https://justruraltransition.org/

56 https://justruraltransition.org/resource/principles-for-just-food-system-transitions/

57 Damania, R. et al. 2023, Op cit.

58 https://www.fao.org/in-action/mafap/programme-overview/en/

59 BIOFIN. In progress. "The Nature of Subsidies: How to improve their impact on biodiversity, society and fiscal system"

60 CIF. 2021. *Designing Fiscal Instruments for Sustainable Forests*. World Bank Group, Washington DC.

61 Ding, H. et al. 2021. Op cit.

62 McFarland, W., Whitley, S. and Kissinger, G. 2015. *Subsidies to key commodities driving forest loss*. Working Paper. Overseas Development Institute, London.

63 Rode, J., Muñoz Escobar, M., Khan, S.J., Borasino, E., Kihumuro, P. et al. 2023. Providing targeted incentives for trees on farms: A transdisciplinary research methodology in Uganda and Peru. *Earth System Governance* **16**: 100172.

64 According to Target 18 of the K-M GBF governments are to "scale up positive incentives for the conservation and sustainable use of biodiversity".

65 McGowan, P.J.K. 2010. Conservation status of wild relatives of animals used for food. *Animal Genetic Resources* **47**: 115-118.

66 See CIFOR, Trees on Farms News 2022 https://forestsnews.cifor.org/77195/why-trees-on-farms-make-a-win-win-for-people-and-nature?fnl=en

67 See UNFCCC COP18 Presidency priorities https://www.cop28.com/pdfs/COP28_Letter_July_2023_1.pdf; United Nations Food System Summit https://www.unfoodsystemshub.org/en

68 https://environment.ec.europa.eu/topics/forests/deforestation/regulation-deforestation-free-products_en

69 https://webarchive.nationalarchives.gov.uk/ukgwa/20230418175226/https://ukcop26.org/glasgow-leaders-declaration-on-forests-and-land-use/

70 Ibid.

71 https://www.unfoodsystemshub.org/en

72 https://justruraltransition.org/

73 https://www.consilium.europa.eu/en/press/press-releases/2023/05/16/council-adopts-new-rules-to-cut-deforestation-worldwide/

74 WWF. 2020. *#the NDCs We Want: Enhancing Forest Targets and Measures in Nationally Determined Contributions*. Woking, UK.

75 For example: scaling up sustainable tree-based food production, integrating nutrition objectives into forest conservation and restoration programs, revising agricultural extension services, integration of trees and woodlands into farming systems, etc.

76 Kumar, C., Begeladze, S., Calmon, M. and Saint-Laurent, C. (eds.). 2015. *Enhancing food security through forest landscape restoration: Lessons from Burkina Faso, Brazil, Guatemala, Viet Nam, Ghana, Ethiopia and Philippines*. Gland, Switzerland: IUCN, Gland, Switzerland.

77 Azevedo-Ramos, C., de Carvalho Jr, O. and do Amaral, B.D., 2006. Short-term effects of reduced-impact logging on eastern Amazon fauna. *Forest Ecology and Management*, *232*(1-3), pp.26-35.

78 Ribeiro, D.B., Freitas, A.V.L. The effect of reduced-impact logging on fruit-feeding butterflies in Central Amazon, Brazil. *J Insect Conserv* **16**, 733–744 (2012). https://doi.org/10.1007/s10841-012-9458-3

79 Lagan, P., Mannan, S. and Matsubayashi, H., 2007. *Sustainable use of tropical forests by reduced-impact logging in Deramakot Forest Reserve, Sabah, Malaysia* (pp. 414-421). Springer Japan.

80 Healey, J.R., Price, C. and Tay, J., 2000. The cost of carbon retention by reduced impact logging. *Forest Ecology and Management*, *139*(1-3), pp.237-255.

81 Healey, J.R., Price, C. and Tay, J., 2000. The cost of carbon retention by reduced impact logging. *Forest Ecology and Management*, *139*(1-3), pp.237-255.

82 White, F. 1983. *The vegetation of Africa: a descriptive memoir to accompany the UNESCO-AETFAT-UNSO vegetation map of Africa*. UNESCO. Paris.

83 Breteler, F.J. 1996. Tropical Africa, especially Gabon. Pp. 39-49 in: Breteler, F.J. and Sosef, M.S.M. (eds.) *Herbarium Vadense 1896-1996*. Wageningen Agricultural University Papers 96-2.

84 Laguardia, A., Bourgeois, S., Strindberg, S., Gobush, K.S., G. Abitsi, G. et al. 2021. Nationwide abundance and distribution of African forest elephants across Gabon using non-invasive SNP genotyping. *Global Ecology and Conservation* **32:** e01894,

85 Global Witness. 2019. *Lessons from China's Global Forest Footprint: How China can rise to a global governance challenge*. London.

86 https://www.forest-trends.org/wp-content/uploads/2022/06/China-Trade-Report.pdf

87 CCICED. 2020. Special Policy Study Report (September 2020) *Global Green Value Chains – Greening China's "Soft Commodity" Value Chains*. SPS-4-2-Global-Green-Value-Chains-1.pdf (cciced.eco) The influential China Council for International Cooperation on Environment and Development published a Special Policy Study in (September 2020) outlining actions China could take to improve the sustainability of soft commodities, recognizing that: "China has the power to catalyse positive changes in global value chains. Promoting global green value chains also offers big opportunities for China. It is consistent with the concept of Ecological Civilization and conducive to strengthening value chain security and ensuring the legality of value [chains]".

88 Greenfield, P. 2023. Revealed: more than 90% of rainforest carbon offsets by biggest certifier are worthless, analysis shows. *The Guardian* 18 January 2023.

89 https://www.fscindigenousfoundation.org/global-south-voices-in-support-of-redd/

90 https://icvcm.org/the-core-carbon-principles/

91 https://vcmintegrity.org/vcmi-claims-code-of-practice/

92 https://tfciguide.org/

93 Hacking, J., Williams, B., Tind Nielsen, S. and Braña Varela, J. 2021. *Beyond Carbon Credits: A Blueprint for High-Quality Interventions that Work for People, Nature and Climate*. WWF, Gland, Switzerland.

94 WWF. 2022. *Our Climate's Secret Ally: Uncovering the story of nature in the IPCC's sixth assessment report*. Gland, Switzerland.

95 WWF. 2022. *Beyond Science-Based Target: A Blueprint for Corporate Action on Climate and Nature*. Gland, Switzerland.

96 WWF-Switzerland. Undated. *Fit for Paris Replacing Kyoto-style CO_2 offsetting: How companies should finance additional climate action*. Zurich.

97 Global Environment Facility. 2023.

98 World Economic Forum. 2022. *Biodiversity Credits: Unlocking financial markets for nature-positive outcomes*. Briefing paper. Geneva, Switzerland.

99 https://www.gov.br/mre/en/contact-us/press-area/press-releases/united-for-our-forests-joint-communique-of-developing-forest-countries-in-belem

100 https://forestclimateleaders.org/

101 https://www.globalwitness.org/en/blog/financial-sector-must-raise-its-voice-to-save-the-worlds-forests/

102 Rockström, J., Gupta, J., Lade, S.J., Abrams, J.F., Andersen, L.S. et al. 2023. Safe and just Earth system boundaries. *Nature* **619**: 102-111.

103 https://climatechampions.unfccc.int/system/nature-and-tackling-deforestation/

104 https://globalcanopy.org/insights/insight/financial-institutions-must-act-now-to-end-deforestation-finance-heres-how/

105 Global Witness. 2021. *Deforestation Dividends: How global banks profit from rainforest destruction and human rights abuses*. London.

106 https://www.un.org/development/desa/en/news/forest/forests-a-lifeline-for-people-and-planet.html#:~:text=Forests%20sustain%20our%20lives%20in,one%20way%20or%20the%20other.

107 https://www.weforum.org/agenda/2022/05/sustainable-finance-challenges-global-inequality/

108 https://www.cgdev.org/blog/mdbs-need-major-reforms-not-just-more-funding-address-climate-and-development-finance

109 Secretariat of the Convention on Biological Diversity. (2010). Global Biodiversity Outlook 3. Montreal, Canada: Secretariat of the Convention on Biological Diversity

110 UN Global Forest Report. 2021. *Global Forest Goals Report 2021*. United Nations.

111 FAO. 2022. The formal forest sector contributes more than USD 1.5 trillion to national economies globally. https://www.fao.org/3/cb9360en/online/src/html/forest-production-global-economy.html

112 Li, Y., Mei, B. and Linhares-Juvenal, T. 2019. The economic contribution of the world's forest sector. *Forest Policy and Economics* **100**(C): 236-253.

113 Interpol. Undated. Forestry Crime. https://www.interpol.int/en/Crimes/Environmental-crime/Forestry-crime

114 Hoare, A. 2015. *Tackling Illegal Logging and the Related Trade: What progress and where next?* Chatham House Report. London.

115 United Nations Department of Economic and Social Affairs, United Nations Forum on Forests Secretariat. 2021. *The Global Forest Goals Report 2021*. New York.

116 Hermann, B., Bakhtary, H. and Conway, D. 2020. *The challenges of forest law enforcement*. Chatham House Report. London.

117 https://www.interpol.int/ar/1/1/2016/Global-corruption-in-forestry-sector-worth-USD-29-billion-a-year-INTERPOL-report

118 TRACIT. Undated. *Mapping the Impact of Illicit Trade on the Sustainable Development Goals*. Transnational Alliance to Combat Illicit Trade. New York.

119 Interpol. 2020. Forestry crime: targeting the most lucrative of environmental crimes. https://www.interpol.int/News-and-Events/News/2020/Forestry-crime-targeting-the-most-lucrative-of-environmental-crimes

120 Fedotov, Y. 2014. How Wildlife and Forest Crime Undermines Development and Ravages Global Biodiversity. Illegal Wildlife Trade LI (2): https://www.un.org/en/chronicle/article/how-wildlife-and-forest-crime-undermines-development-and-ravages-global-biodiversity

121 Interpol. Forestry Crime. Op cit.

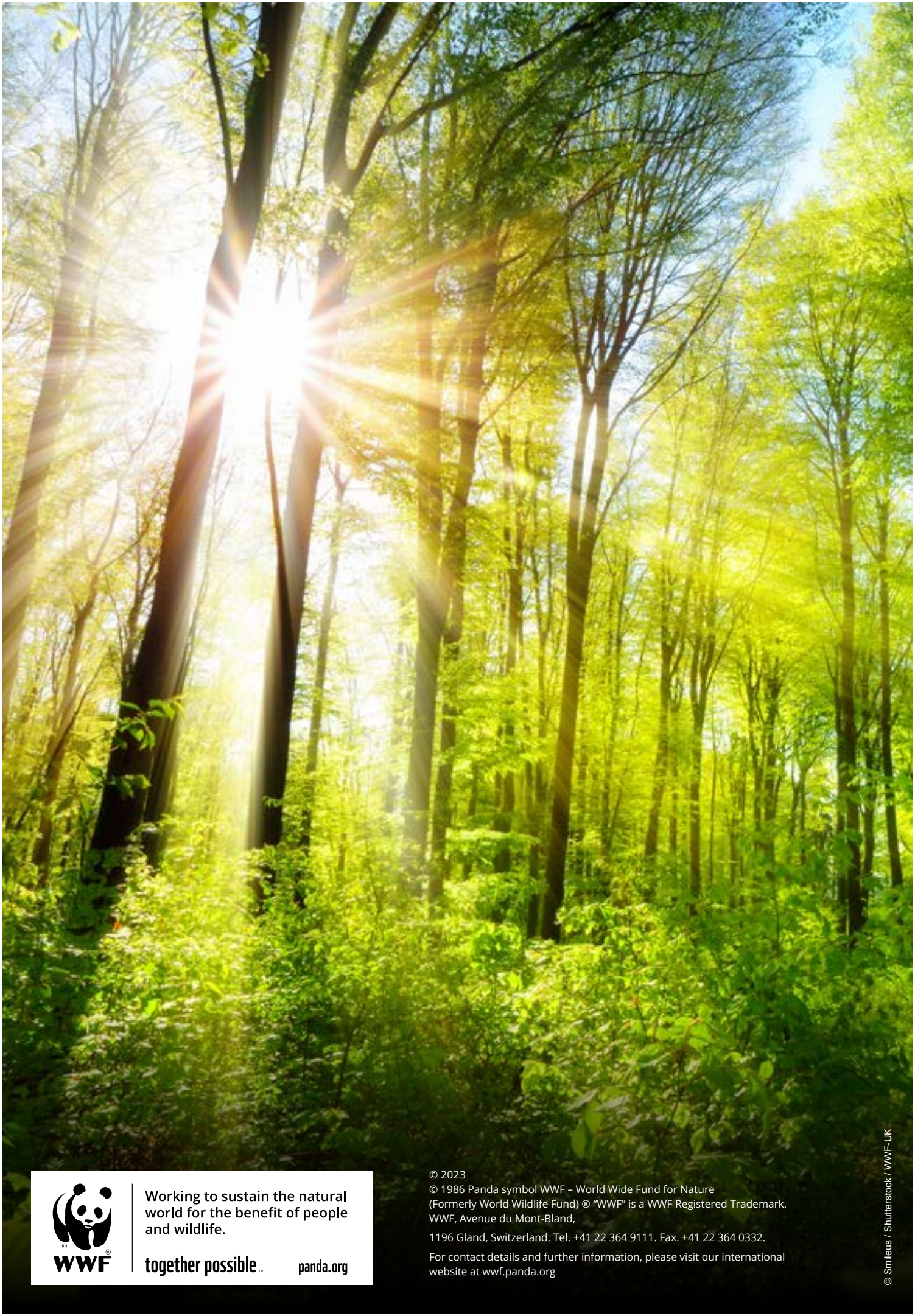
122 Contreras-Hermosilla, A., Doornbosch, R. and Lodge, M. 2007. *The Economics of Illegal Logging and Associated Trade*. Round Table on Sustainable Development, Paris 8-9 January 2007.

123 https://www.oecd.org/dac/financing-sustainable-development/development-finance-standards/official-development-assistance.htm

124 Traceability Systems: Potential Tools to Deter Illegality and Corruption in the Timber and Fish Sectors? (https://www.worldwildlife.org/pages/tnrc-topic-brief-traceability-systems-potential-tools-to-deter-illegality-and-corruption-in-the-timber-and-fish-sectors)

125 Using Wood Forensic Science to Deter Corruption and Illegality in the Timber

Trade (https://www.worldwildlife.org/pages/tnrc-topic-brief-using-wood-forensic-science-to-deter-corruption-and-illegality-in-the-timber-trade)
126 https://www.preferredbynature.org/sourcinghub/info/illegal-logging-0
127 https://www.woodrisk.org/
128 Ibid
129 FAO. 2020. *Global Forest Resources Assessment 2020*: Main report. Rome.
130 Pacheco, P., Mo, K., Dudley, N., Shapiro, A., Aguilar-Amuchastegui, N. et al. 2021. *Deforestation fronts: Drivers and responses in a changing world*. WWF, Gland, Switzerland.
131 Shono K. and Johnson Ö. 2022. Global progress towards sustainable forest management: bright spots and challenges. *International Forestry Review* **24** (1): 85-97.
132 AFD – Agence Française de Développement. 2021. *In the Struggle to Make Forests Sustainable, how Effective are Verification Systems?* Paris.
133 https://unece.org/ecosystem-services-0
134 https://connect.fsc.org/document-centre/documents/resource/316
135 Gamfeldt, L., Snäll, T., Bagchi, R., Jonsson, M., Gustafsson, L. et al. 2013. Higher levels of multiple ecosystem services are found in forests with more tree species. *Nature Communications* **4**: 1340.
136 Jaung, W., Putzel, L., Bull, G.Q., Kozak, R. and Elliott, C. 2016. Forest Stewardship Council certification for forest ecosystem services: An analysis of stakeholder adaptability. *Forest Policy and Economics* **70**: 91-98.
137 Vallauri, D., Darteyron, L.-E. and Laurans, Y. 2022. *Paying Foresters to Provide Ecosystem Services?* WWF-France, Paris.
138 https://www.sciencedirect.com/science/article/pii/S0960982222015408 and https://www.nature.com/articles/s41893-021-00815-2
139 Ibid.
140 Ibid.
141 https://explorer.land/p/organization/ifo/forests-forward
142 The Nature Conservancy and TerraCarbon. 2016. *VM0035 Methodology for Improved Forest Management through Reduced Impact Logging*. Verified Carbon Standard.
143 https://ikea.wwf.se/articles/chainsaws-tree-huggers-in-the-land-of-fairy-tales/
144 WWF-Colombia: https://wwf.org.co
145 Lastra Mier, R.E. 2015. Degradación medioambiental como consecuencia del conflicto armado en Colombia. *Legem* **3** (1): 59 – 70.
146 https://cambiocolombia.com/articulo/planeta/la-apropiacion-masiva-de-tierras-es-la-gran-sombrilla-de-la-deforestacion-en
147 Spring, J. and Stargardter, G. 2023. 'Narco deforestation' in focus at upcoming summit of Amazon nations. Reuters 3 August 2023.
148 https://www.minambiente.gov.co/gobierno-petro-logra-historica-reduccion-de-la-deforestacion-en-2022/
149 International Crisis Group. 2021. *A Broken Canopy: Deforestation and Conflict in Colombia*. Brussels.
150 Murillo-Sandoval, P.J., Kilbride, J., Tellman, E. et al. 2023. The post-conflict expansion of coca farming and illicit cattle ranching in Colombia. *Scientific Reports* 13: 1965.
151 Cardona, A.J. 2023. Mongabay: *En tres décadas, más de 3 millones de hectáreas de la Amazonía colombiana se convirtieron en pasturas ilegales para ganadería*. https://es.mongabay.com/2023/03/deforestacion-amazonia-colombiana-ganaderia-bosques/
152 Clerici, N., Armenteras, D., Kareiva, P., Botero, R., Ramírez-Delgado, J.P. et al. 2020. Deforestation in Colombian protected areas increased during post-conflict periods. *Scientific Reports* **10**: Article 4971.
153 International Crisis Group. 2021. Op cit.
154 Ibid.
155 Güiza, L. Montoya, J. Botero, R. Benítez, E. and Cante, C. 2021. *Motores de la deforestación en Colombia una mirada desde la investigación penal*. Editorial Universidad del Rosario.
156 Ruiz, J.P. 2022. *Deforestación y especulación predial*. Revista Experto, Universidad Externado de Colombia.
157 https://www.wwf.org.co/?378471/Foresteria-comunitaria-una-alternativa-contra-la-deforestacion
158 Camacho A., Lara I. and Guerrero R.D. 2017. *Interpretación Nacional de las Salvaguardas Sociales y Ambientales para REDD+ en Colombia* MADS, WWF-Colombia and ONU REDD Colombia, Bogotá-Colombia.
159 https://www.greenclimate.fund/project/fp203
160 WWF, adelphi and FiP. 2021. *Un Clima Peligroso*. WWF-Germany, Berlin.
161 Ángel, J., Ordoñez, M., Olivero, J., Echavarría, C., Ayala, H. and Cabrera, M. 2019. *Consideraciones sobre la minería en el departamento del Chocó y recomendaciones para mejorar la gestión*. Geopatrimonio – Universidad de Cartagena – IIAP – WWF, Cali – Colombia.
162 Alianza Amazónica para la Reducción de los Impactos de Minería de Oro. Recomendaciones de la Alianza Amazónica para la reducción de los impactos de la minería de oro, en el marco de la construcción del Plan Nacional de Desarrollo 2022-2026 de Colombia Noviembre 18 de 2022.
163 https://www.wwf.org.co/en/?375873/Gobierno-del-Reino-Unido-WWF-Colombia-y-Grupo-xito-se-unen-por-el-consumo-y-la-ganaderia-sostenible-en-Colombia
164 https://www.worldpoliticsreview.com/petro-colombia-amazon-deforestation/
165 Clerici, N. et al. 2020. Op cit.
166 Gaynor, K.M., Fiorella, K.J., Gregory, G.H., Kurz, D.J., Seto, K.L. et al. 2016. War and wildlife: linking armed conflict to conservation. *Frontiers in Ecology and the Environment* **14** (10): 533-542.
167 Sax, S. 2023. *Peace: A new tool for reducing deforestation in the Colombian Amazon*. https://news.mongabay.com/2023/07/peace-a-new-tool-for-reducing-deforestation-in-the-colombian-amazon/
168 Such as the IPs exchanges that the Colombian government has promoted through its Amazon Vision programme: https://visionamazonia.minambiente.gov.co/news/intercambio-de-saberes-factor-diferencial-en-el-trabajo-con-pueblos-indigenas/
169 Cheston, T., Goldstein, P., Freeman, T., Rueda-Sanz, A., Hausmann, R. et al. 2023. *Mirar el bosque más allá de sus árboles: Una estrategia para frenar la deforestación y avanzar en una prosperidad compartida en la Amazonía colombiana*. CID Faculty Working Paper number 430. Harvard University.
170 We note there is no mention on whether the national commitments are only on domestic footprint or also include overseas footprint, but the overall aim is to reduce global footprint. While open to interpretation, both domestic and international footprint of major consumer countries need to be addressed to achieve the global footprint of consumption and production reduction included in the GBF. CBD Parties should integrate specific objectives, linked to GBF targets to take transformative actions to reduce global footprint (e.g 5, 7,10, 14-16 and 18). Countries with a bigger footprint will need to reduce their footprints more, so that action on environmental footprint supports a just transition.
171 WWF-UK and RSPB 2020. *Riskier Business: The UK's External Land Footprint*.
172 Jennings, S. and Schweizer, L. 2019. *Risky Business: The risk of corruption and forest loss in Belgium's imports of commodities*. WWF-Belgium.
173 Jennings, S. and de Korte, M. 2018. *Risky Business: the risk of corruption and forest loss in France's imports of commodities*. WWF-France.
174 Jennings, S. and Cooper, H. 2020. *Risky Business: The risk of corruption and forest loss in Denmark's imports of soy, timber, pulp and paper*. WWF-Denmark.
175 Jennings, S., Cooper, H. and McCormack, C. 2020. *Risky Business: Deforestation and social risks in Switzerland's imports of commodities*. WWF-Switzerland.
176 Jennings, S., Meijer, S. and van Dooren, C. 2022. *The impact of Dutch imports on nature loss worldwide*. WWF-Netherlands.
177 Buckland-Jones, S., Cooper, H., Evans, R., Jennings, S., Munkedal, C. and Rahman-Daultry, K. 2021. *Wales and global responsibility: addressing Wales' external land footprint*. WWF-Cymru, RSPB Cymru and Size of Wales.
178 UN Comtrade. 2023. https://comtradeplus.un.org/
179 Conversion factors. Soy: Roundtable on Responsible Soy 2022. Soy Conversion Factors. Cocoa: Fairtrade International (2013). Questions & Answers: Cocoa conversion rates for mass balance. Coffee: The Coffee Guide. International Trade Centre.
180 FAOSTAT. 2023. https://www.fao.org/faostat/en/
181 de Weert, L. 2021. LUC Impact Tool. Blonc Consultants. https://blonksustainability.nl/news/update-of-the-blonk-direct-land-use-change-assessment-tool
182 IPCC. 2019. Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Introduction (Vol. 4 Chapter. 1). https://doi.org/10.1016/S0166-526X(00)80011-2
183 BSI. 2012. PAS 2050-1: 2012 Assessment of life cycle greenhouse gas emissions from horticultural products. BSI.
184 WRI. 2023. Climatewatch. https://www.climatewatchdata.org/data-explorer/historical-emissions?historical-emissions-data-sources=climate-watch&historical-emissions-gases=all-ghg&historical-emissions-regions=All%20Selected&historical-emissions-sectors=total-including-lucf%2Ctotal-including-lucf&page=1
185 https://unfccc.int/NDCREG?gclid=CjwKCAjw04yjBhApEiwAJcvNoUULBVyPQ_XYQnyWEjDWcB-Wg2Ytb6G6B28TAHysoSWYvR_A1g3HhoCFcsQAvD_BwE



Working to sustain the natural world for the benefit of people and wildlife.

together possible™ panda.org

WWF, Avenue du Mont-Bland,
1196 Gland, Switzerland. Tel. +41 22 364 9111. Fax. +41 22 364 0332.

For contact details and further information, please visit our international website at wwf.panda.org