



LEVIN SOURCES

Miners as forest stewards

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About this white paper

Levin Sources has recently signed onto the **New York Declaration on Forests**, a partnership of governments, multinational companies, civil society and indigenous peoples working to halve deforestation by 2020, and end it by 2030. The world has lost 50% of its forests already, and we are losing 48 football fields of forest every minute.

Forests are essential for all life to exist on earth, due to their importance in stabilising ecosystems and acting as a carbon sink, which in turn stabilises carbon levels in the atmosphere. But forests are increasingly being threatened, by mining and other human activities, at alarming levels. The world has lost 50% of its forests already, and deforestation is escalating across the world. One-third of carbon emissions are caused by deforestation – equalling the amount of carbon emissions created by oil consumption.

The mining industry is the 4th most significant driver of deforestation, responsible for 7% of the global total per annum. In 2015, 20% of the world's forests are within 50 kilometres of an active mine, and an estimated 1500 mines – nearly half of operational large-scale mines – are operating in forests. An additional 1,826 mines operating in forests are in development, or non-operational.

The top 3 minerals mined in forests are **gold, iron ore, and copper**, while **aluminium, titanium and nickel** have the highest reliance on forest mines.

All mine companies – not just ICMM members – must agree to respect no-go zones, and prioritise forest protection in their operations. Miners can also make a public commitment to protect and nurture trees by signing the New York Declaration on Forests, implementing the World Bank's Forest-Smart Mining Principles, and putting forests first in all phases of the mining life cycle. Miners can also reduce their impact on forests by prioritising brownfield sites over greenfield sites, auditing and disclosing their forest, carbon and water footprints, and embedding the goals of the UN Decade of Restoration into their policies.

In this paper, you will find:

- An introduction to the importance of forests in managing carbon emissions
- Information on how forests are being impacted by mining activity
- Risks associated with continued deforestation at current levels
- Measures miners can take to minimise their contribution to deforestation

We welcome your feedback, comments and questions on the contents of this paper. Please do not hesitate to get in touch with our expert team: hello@levinsources.com.

Levin Sources is a consultancy and social venture that moves more raw materials through systems where good governance and better business are the norm.

We are a core team of strategists, researchers, project managers, educators and communicators with multidisciplinary abilities and collective expert knowledge in sustainable supply chains, extractives, minerals science & engineering, biodiversity and conservation, human rights and vulnerable groups, responsible business conduct and good governance.

We are trusted by the full diversity of players in the minerals system, from Fortune 500 companies and SMEs to industry associations and certification bodies to NGOs and civil society to governments in fragile states and in G20 economies.



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Introduction

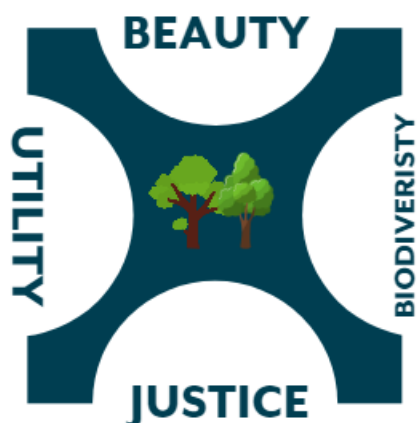
On 1st May 2019, I presented an ignite talk to a community of business, governments, academics, and NGOs at the [launch](#) of the [World Bank's Climate Smart Mining Facility](#). The purpose of the talk was to inspire all players in the minerals system to do their part to protect forests, building upon the World Bank commissioned study that [Levin Sources](#) has done on [Forest-Smart Mining](#) with our partners, [Fauna and Flora International](#) and [Swedish Geological AB](#).

Much of the debate in the morning session had been on innovation, cooperation and technologies as the key routes to Climate Smart Mining. Forests were not mentioned once. This betrays a sectoral bias in favour of the technical and away from the natural. We must shift this mentality to bring forests back into the discussion with fuller understanding of not only their importance, but their tremendous potential as an opportunity to help the mining industry become carbon neutral, and ultimately carbon corrective. In a world where industry fixates on technology and information to solve global challenges, reconceiving of forests as *natural technologies* and the *libraries of life* may do much to reconfigure the debate, making it possible for us to stop the continued destruction of our primary forests in order to uphold the [New York Declaration on Forests](#)' commitment to halve deforestation by 2020 and halt it by 2030.

In my talk, I made the moral case for Forest-Smart Mining rather than the business case because it seems ridiculous to have to justify the protection of forests in business terms, when life on Earth – and indeed our own survival and avoidance of huge societal disruptions and conflict – ultimately depends on forests. It is ideological to put business first; it is scientific to put forests first. In spite of this moral imperative, we have to build the business and political cases for forests, as it clearly isn't strong enough yet.

What follows is an adaptation of my talk as a narrative to hopefully inspire and equip members of the mining industry to embrace the concept of forest-smart mining and incorporate it into their ESG systems and corporate decision-making. The publication of key findings from the [UN IPBES' Global Assessment Report on Biodiversity and Ecosystem Services](#) on 6th May has provided additional damning evidence of the 'unprecedented rapid decline' in Nature, and the rapid acceleration of pressures, such as a doubling of carbon emissions since 1980. [Scientists say we have 11 years before we go past the point of no return on climate change](#) and [over 1 million plant and animal species are threatened with extinction within decades](#); there is no time like the present. It is indeed an emergency.

Why should we care about forests?



Scientists estimate that there are between 10 and 100 million species on the planet. Of these, 1.7 million have been scientifically described, and of these 1.7 million, only 1% - [less than 17,000 - have been carefully studied](#). We do not know what life on Earth has to offer us and yet we are letting it rapidly disappear.

By mass alone, in 50 years we have lost over 50% of all animals. In 100 years, large mammals have plunged by 97%. We are experiencing – and we are responsible for - [the 6th mass extinction](#).

Although tropical forests cover just 6% of the world's surface area, scientists estimate that [50-75% of the world's animals and plants live there](#). The intensity of biodiversity in tropical climates, and the rate of endemism makes the tropics hugely important. In fact, a land area of [0.5 km² in some tropical forests contains more tree species](#) than the entire land mass of Europe and North America combined. [Temperate forests](#) may be less rich in biodiversity by comparison, but the biodiversity they harbour still matters.



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In a world where we place increasing value on information, could Damian Carrington's explanation of why biodiversity matters convince corporations and governments to – at a minimum – protect it? He says biodiversity “represents the knowledge learned by evolving species over millions of years about how to survive through the vastly varying environmental conditions Earth has experienced.” Seen like that, when we destroy a forest, we are “[burning the library of life](#)”.

But the world has lost 50% of its forests already and we are [losing 48 football fields of forest every minute](#). Landsat data demonstrates that forest disturbance and [deforestation is escalating](#) around the world. In DRC, the world's 4th most important country for biodiversity and also a key mining destination, [primary forest loss was 38% higher in 2018](#) than average forest loss from 2011-2017.

Although satellite data reveals that plant growth across the planet is increasing, in a phenomenon known as “[global greening](#)”, it is important to understand that vegetation cover is not equivalent to primary forests. Measures of vegetation cover include croplands and cultivated farmlands, which are the main drivers of deforestation.

Without forests, the world's **biodiversity** diminishes irreparably, and we are weaker and less able to adapt.

Beyond biodiversity, billions of people directly depend on forests - and of course, we all do, indirectly. Forests provide us with [ecosystem services](#). They:

- provide half of the world's oxygen,
- supply drinking water and pharmaceuticals,
- act as buffers and provide resources to minimise the impact of disasters,
- provide livelihoods to [25% of the world population](#), and
- provide cooking and heating materials for [30% of people worldwide](#).

These are the utilitarian arguments. But the philosophy of sustainability also compels us to protect forests for reasons of **social justice**, across space and time. We are diminishing natural and cultural heritage for future generations and violating others' human rights today by destroying irreplaceable biodiversity and denying others' access to crucial ecosystem services. What gives us the right?

Forests are also a thing of great **beauty and wonder**. [People are happier in urban environments with trees](#). Speaking personally, being in a forest is life-enhancing for me; it brings me such joy and meaning and gives me a handle on the thread of life and time, and my place in it. I seek out forests for moments of contemplation, therapy, and of course discovery and play. Without forests, we are all worse off. Mark Cocker puts this brilliantly in his excellent book, [Our Place](#):

"Environmentalism is always binary in nature. You cannot have the sum of human responses without the totality of its natural counterpart. And conservation seeks to safeguard the potentialities of both: the other species for themselves so that they might persist on our shared planet; but also the spectrum of our own internal engagements, which those other life forms inspire - responses that are imaginative, creative, cultural, intellectual, spiritual. It is a point conservationists often fail to convey, or even to grasp themselves. Environmental loss is not just out there in the real world. It is lost from within us too."

But perhaps most crucially, forests are **essential to all life on earth** because they regulate ecosystems. Forests help stabilise carbon levels in the atmosphere because they are enormous carbon sinks.

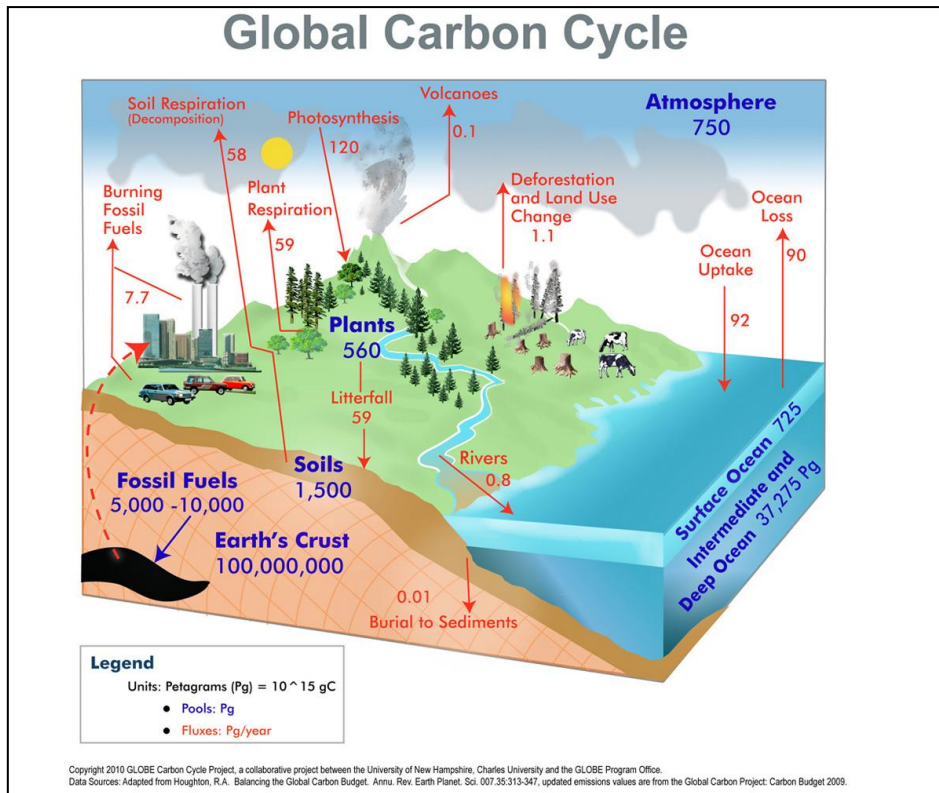


Photo credit: NASA/GLOBE Program

When we destroy forests, we don't only annihilate the service of carbon absorption, we release carbon into the atmosphere. It is a double whammy. Today, [1/3 of CO2 emissions are caused by deforestation](#), matching the contribution of oil consumption. If we stopped deforestation, we would [get 1/3 of the way toward limiting global warming to 2 degrees C](#). We would also save money because [maintaining forests is less costly](#) than trying to introduce (hu)man-made technologies to replace lost ecosystem functions and address diminished resilience.

[Research by Dr. Thomas W. Crowther](#) in 2019 suggests that **there are enough parks, abandoned land and degraded woods to allow for us to plant at least 1.2 trillion trees** before we need to go into agricultural land. If we could accomplish this, we would suck up 400 gigatons, or a decade of carbon emissions. [The Trillion Trees Campaign](#) buys us time to adapt our systems to being more truly climate-smart, and presents the mining industry with opportunity for leverage and good news stories.

We have to nurture and protect forests. But this requires agreement on [no-go zones](#) across the *entire* mining sector (not just [ICMM members](#)) and in alignment with [scientific and political guidance](#). It also requires all economic actors to be proactive and prioritise forest protection in how they operate. This especially includes the mining industry because mining is the [4th highest driver of deforestation](#) and affects [18% of World Heritage Sites](#).

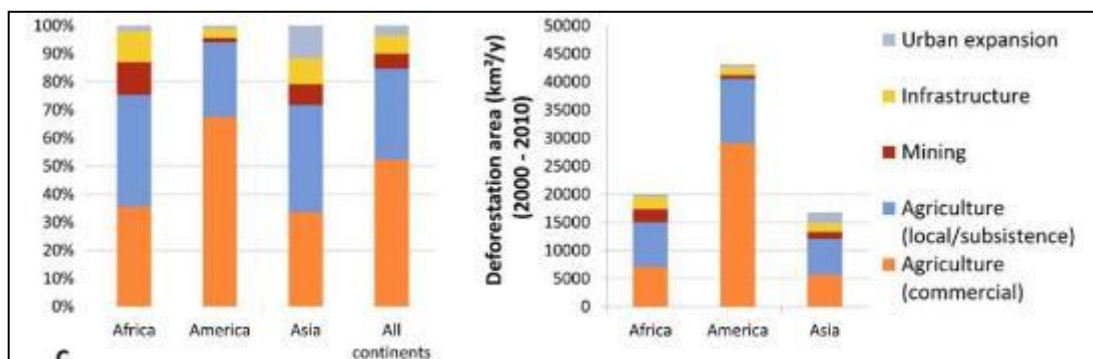


Figure 1. Drivers of tropical and subtropical deforestation by percentage and area by continent. From [Hosonuma et al.](#)

Forest-smart mining

[Forest-smart mining](#) is mining in ways that protect forests and forest values. The World Bank Program on Forests (PROFOR) defines forest-smart as “a development approach that recognizes forests’ significance for sustaining growth across many sectors, including agriculture, energy, infrastructure, and water. It is sustainable and inclusive in nature, emphasizing that forests are part of a broader landscape and that changes in forest cover affect other land uses as well as the people living in that landscape. It transforms how sectors operate by identifying opportunities for mutual benefit and creating practical solutions that can be implemented at scale”.

The top 3 minerals mined in forests are **gold, iron ore, and copper**, while **aluminium, titanium and nickel** have the highest reliance on forest mines.

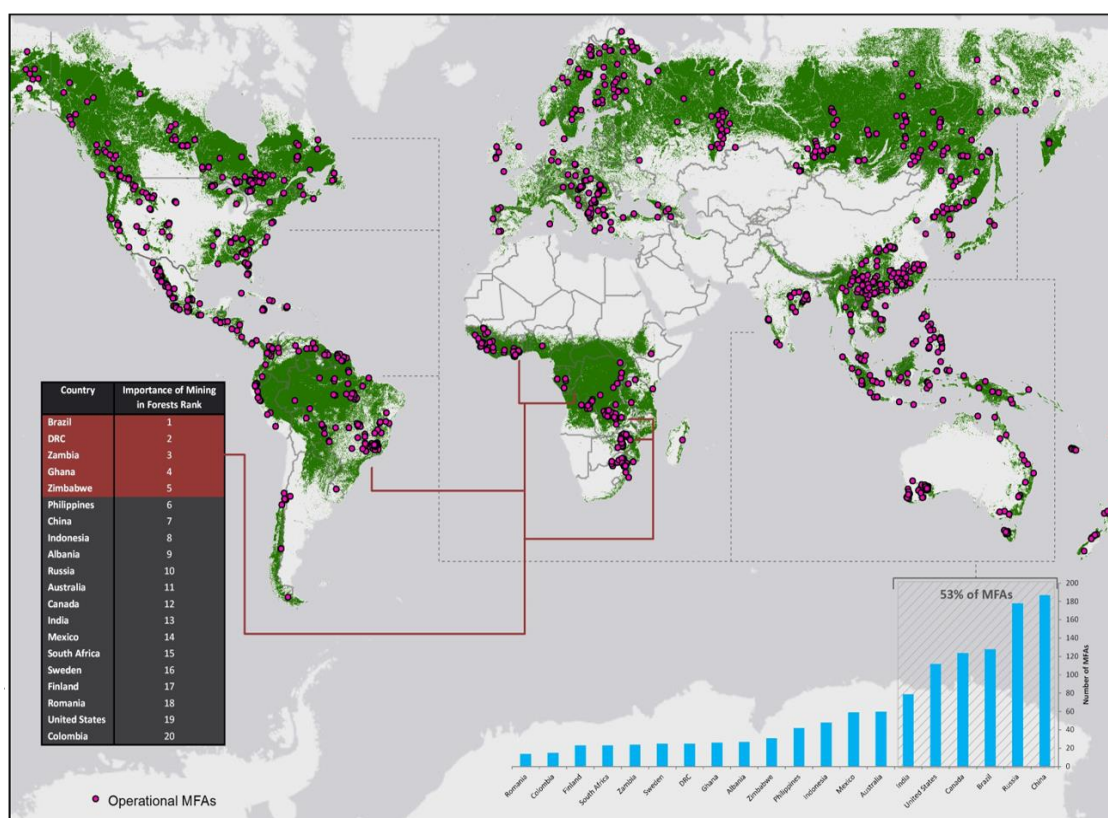


Figure 2. Map representing the global extent of mines in forested areas. Credit: © Jonathan Knox, Fauna & Flora International

In 2015, [10% of the world’s forests are within 50km of an active mine](#), and approx. 1500 or almost half of the operational large-scale mines were operating in forests. A further 1,826 were in development or non-operational mines, which, as defined by the Raw Materials Database, are an amalgamation of closed, suspended, abandoned, and ‘status unknown’ mines. Seven percent of the active forest mines are in tropical rainforest.

Over half of large-scale forest mines are in low- or lower-middle-income countries, and three-quarters are in World Bank client countries, where sector governance is typically weaker and forests are less protected.

[Artisanal and Small-scale Mining](#) is also occurring in tropical forests, mangroves and temperate forests all over the world, from Ukraine and Brazil to Indonesia and Madagascar.

Most forest mining occurs in some of the biggest mineral-producing countries. Priority countries for attention include China, the Russian Federation, the US, Brazil, the DRC, Zambia, Ghana, Zimbabwe, the Philippines, Indonesia, and

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Albania, where there is high forest cover, high economic dependence on mining, a high density of mines in forest areas and high contribution of forest degradation and loss to national greenhouse gas emissions.

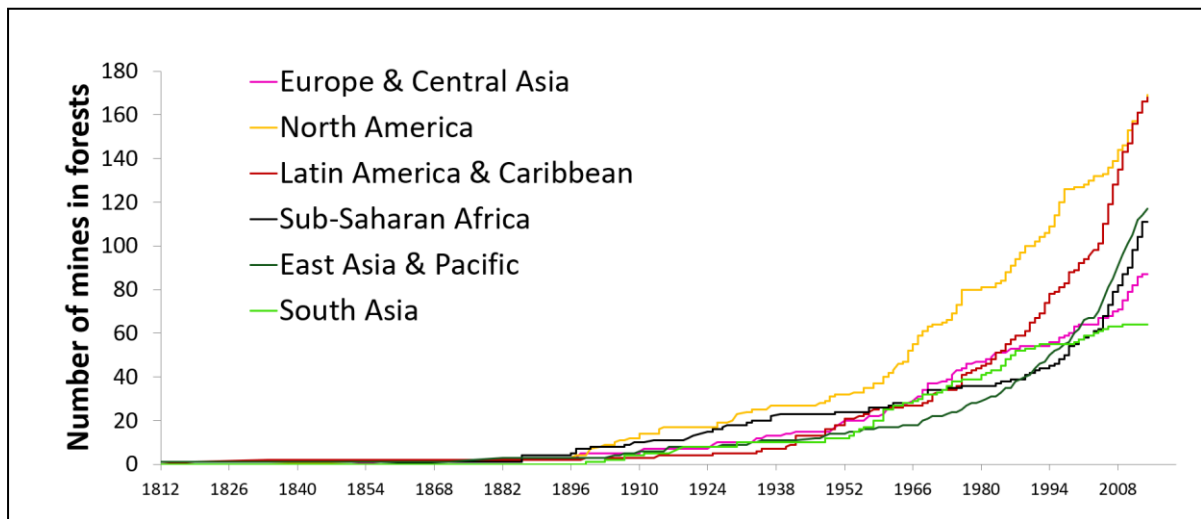


Figure 3. Graph showing the number of mines operating in forests in each region. Graph credit: Fauna & Flora International.

And mining in forests is growing. Most of the growth in forest areas is in the tropics. The mining sector's growth continues in response to rising demand for minerals and metals, especially in reaction to an acceleration in the transition to the green economy. [There are more metals predicted to be needed](#) by 2050 than over the last 100 years in order [to achieve a low-carbon society](#). How will we support this transition without destroying forests? In carbon and sustainability, terms it is the equivalent of stealing from Peter to pay Paul.

Time for action

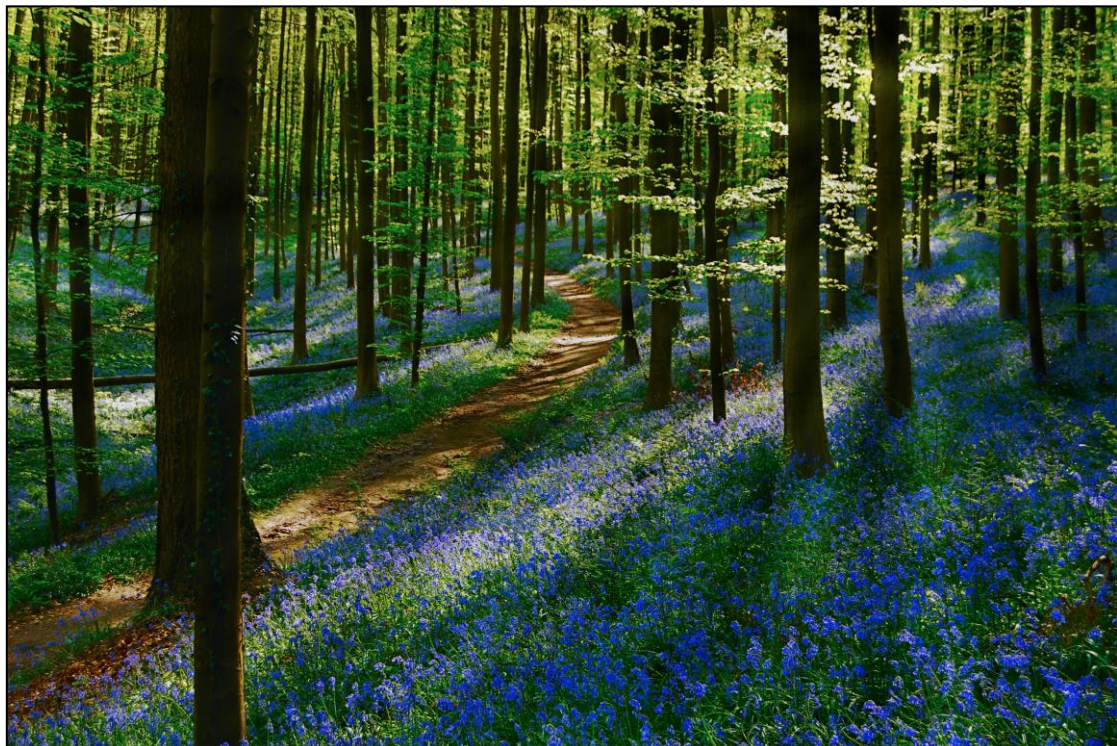
Here are some things miners can do. Many of these measures also apply to their business partners, and to governments who regulate them.

1. **Make a public commitment** to not just protect trees, but to nurture them! Sign the [New York Declaration on Forests](#). Cascade this commitment into your operational policies and procedures.
2. Implement the World Bank's [Forest-Smart Mining Principles](#). Help us to translate these principles into practice, to demonstrate what forest-smart mining can really be. Help us improve them to become as actionable as possible.
3. Put forests first in **all phases of the mining life cycle**. This is especially important for prospectors and developers, during infrastructure development and closure.
4. **Site well**. Don't deforest primary or old-growth forest, especially in the tropics.
 - **Go brownfield** before you go greenfield. Reprocessing tailings can be highly economical, and offer the market a more sustainable product. Check out Metalkol's [Clean Cobalt Framework](#) for inspiration.
 - **Respect no-go areas** and lobby governments to create them, and to respect them too.
 - If you have to deforest: **minimise, offset and pursue net gain**.
5. **Stop polluting!** The pollution of air, water, and soil damages biodiversity.
6. **Pursue bioremediation**. [Afforestation](#) or reforesting damaged land restores ecosystems by locking in contaminants like heavy metals.
7. **Stop wasting water!** When environments are water stressed, biodiversity suffers and forests can die. Become a Partner of the [Global Water Partnership](#).
8. Embed the goals of the [UN Decade of Restoration](#) into your policies.
 - Make ecological restoration and especially afforestation or reforestation part of business as usual.

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- But don't monocrop. Apply [sustainable forestry](#) the whole way. Increasing vegetation cover (quantity) is an inferior option to maintaining and enriching biodiversity (quality).
 - Get involved in the [trillion trees campaign](#). Perhaps there is an afforestation or reforestation campaign in the country you're operating in – how can you support it? Perhaps there isn't one; how can you work with government and other stakeholders to initiate it?
9. Use forests to secure your **licence to operate**. Embed forest protection into your stakeholder engagement and impact assessment work. Pursue forest protection and planting as strategies to mitigate social and economic risks and to build a positive legacy.
 10. **Audit your forest and water footprints**. Include both direct and indirect impacts. Develop forest-smart strategies for priority countries and priority minerals. Get on with it. Measure progress. Review and refresh each year.
 11. **Disclose** your forest footprint and your carbon and water emissions. Disclosing helps others hold you to account, securing the business case for forest-smart mining, and helping society understand the true scale of our emissions to support country-level planning. Check out [CDP and their guidance](#) on how you do it.
 12. **Be circular**. Introduce circularity into the [design of your processes and procedures](#). Some non-obvious and additional (small) measures that add up include introducing circularity into your office functions – no more disposable cups, pencils not pens, vegetarian or low-carbon meat meals in canteens and at functions, offsetting all travel including for events you organise. Although these are small things, they are quick wins, and, importantly, they give a visible and pervasive message to staff and business partners that you're serious about materials efficiency. You can also see how to introduce circularity into your operations, which is probably the higher priority in terms of improving materials efficiency!
 13. Figure out how you **take others along** with you – your team, your board, your industry! What will it take to get them to make forest protection a priority? How can you make it easy for them?
 14. Do more than you really need to, because you can be sure that others are doing nothing.

And when you've done all that, go walk in a forest. You won't regret it.



The Bluebells wonder in the Hallerbos forest, Belgium. Photo credit: Vincent Brassinne

What more do we need to make these actions a reality?

The onus for change does not sit on mining companies alone. The role of government is extremely significant, as they must create an enabling environment for forest protection actions to be feasible. Markets too must expand their focus on due diligence on human rights to include due diligence on environmental values, including forests, water and carbon. When the market, government and industry are aligned, change is so much swifter and sustainable.

Mining companies can't do this alone. They need to work together, and with partners along and around their supply chains to tackle barriers to forest protection and to harness the opportunities that forests can offer. Can we leverage or extend existing structures, models and approaches, or must we innovate?

We have to foster knowledge sharing and showcase examples of good practice. Following my talk, I was delighted to hear panellists and participants sharing choice case studies of where industry and government have protected and restored forests to the benefit of communities, economies and biodiversity in various locations. Find ways for industry leaders, such as ICMM members, who often demonstrate best practices, to transfer knowledge to smaller mining entities in jurisdictions where these world-class companies are unable to operate due to shareholder resistance and severe risks of human rights and responsible business conduct violations. If we can build a directory of good practice, and forge knowledge exchange between those facing a forest dilemma and those who've tackled such dilemmas well, we can lubricate the brakes on deforestation.

Articulating the opportunity in carbon terms and economic terms can make forest protection more accessible and likely. If crushing rock produces 3% of global carbon emissions¹, how many trees would we need to protect or plant to offset that? If we could plant 1 billion trees in the mining sector, what costs would we be saving the sector and what would we save society?

Miners as stewards

It's time for miners to be forest-smart. We have to reconcile our need for minerals with our need for forests. Many citizens largely see mining as a necessary evil; the industry has a tarnished reputation, and the negative publicity generated by recent disasters, like the ones that happened in 2019, including [Vale's Brumadinho dam failure in Brazil](#), [mudslides at Myanmar jade mines](#), and the [Hindalco tailings failure in India](#) is punitive. But miners have tremendous and impressive capabilities to work across disciplines, innovate, and negotiate extraordinarily complicated political and economic challenges. In this sense, they have so much to offer in our quest to solve global challenges. This is one of the reasons I am so passionate about mining and miners. Is protecting forests really beyond miners? I don't believe so. Miners can and must become forest stewards. The mining industry has an opportunity to deny critics the joy of saying, 'Mining is dirty and has no place in a sustainable future' and re-assert their identity as environmental stewards, pursuing and achieving carbon neutrality through innovation and good governance. They have an opportunity to be forest champions and trailblazers in our quest for climate repair. [Levin Sources](#) will continue to do what we can to help them grasp it.

¹ Paul Lefebvre, Government of Canada, speaking at the Launch of the World Bank's Climate-Smart Mining facility, 1st May 2019.

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