Canada's role in International Climate Finance:

A briefing note by the International Conservation Fund of Canada

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Key Points

- Of the US$100 billion in climate finance developed countries agreed to provide to developing countries, what is Canada's share? We think it should equal Canada's share of the cumulative emissions of developed countries, which is 3.7%, applied to the *public portion* of the committed funds. This translates into an annual contribution of US$2.89 billion (about 3.8 billion CAD). While large, this level of expenditure is justified.
- At least half should be applied to nature-based climate solutions (NbS).
- At least half should be applied to climate change adaptation, which is made easier through application to nature-based solutions.
- Priorities with respect to NbS are: curtailing tropical deforestation – especially that involving intact primary tropical forest and peatlands; restoration of degraded natural forest; and the conservation or restoration of coastal ecosystems.
- If half of the recommended climate finance assistance were applied to NbS in programs providing US$5 to US$10 per tonne of avoided or negative carbon emissions, the annual emissions benefits would equal 20 to 40 percent of Canada's annual emissions.
- For transparency, Canada should make public the breakdown of grants, concessional loans, and any non-concessional loans, equity finance or guarantees.

Introduction

Canada and other industrialized countries affirmed in the Paris Climate Agreement their commitment to mobilizing US$100 billion per year to help developing countries mitigate and adapt to climate change. Canada committed $2.65 billion over five years from 2015/2016 to 2020/2021. So far, the bulk of Canada's funding has gone toward technological approaches to mitigation such as clean energy and climate adaptation measures. A relatively small portion has been applied to conserve and restore natural ecosystems and other natural climate solutions.[i]

Canada's fair share

Canada is responsible for 2% of the world's cumulative CO_2 emissions, but what is relevant to international climate finance assistance is our share of cumulative emissions from *developed* countries—after all, this concerns assistance from developed to developing countries. That share is 3.7% (as of 2018).[ii] The 2009 Copenhagen Accord stated that the funding "will come from a wide variety of sources, public and private, bilateral and multilateral". This complicated the commitment as the level of private finance cannot be determined in advance. But we can use recent figures to estimate the goal in terms of public finance. Private finance made up 22% of total climate finance aid in the period 2013-2017.[iii] Applying this along with Canada's 3.7% share to the US$100 billion commitment means a contribution from Canada of US$2.89 billion annually, or about 3.8 billion CAD. This is a large amount – more than one percent of the $355.6

billion in federal spending projected in the 2019-2020 federal budget. But it is a small percentage compared with Canada's war-time defence spending, which peaked at over 60% of the federal budget in the First World War and at about 80% in the Second World War. The compelling need for accelerated climate change action more than justifies such an expenditure. Climate change is by far the greatest threat to world security, food systems, and economies and is expected to soon exceed habitat loss as the greatest threat to biodiversity. To do its part, Canada must both accelerate reductions in domestic emissions and provide strong climate finance assistance to developing countries.

The collective commitment of $100 billion is itself modest. Climate finance overall is falling far short of what is needed to keep temperature increase from pre-industrial levels below 2°C, let alone 1.5°C.[iv] Conversely, fossil fuel subsidies worldwide totalled $320 billion in 2012,[v] while only 1% of $700 billion a year in agricultural subsidies has gone to environmental protection, and much if it promotes high-emission cattle production, forest destruction and pollution from the overuse of fertilizer.[vi]

Mitigation measures

Mitigation measures that are not nature-based are outside ICFC's area of expertise, but to address the broader context, we offer a few remarks here. The balance of this brief concerns adaptation and nature-based solutions.

As global demand for modern energy services grows, greenhouse gas emissions from developing countries are expected to greatly exceed those of economically advanced countries by mid-century. Thus, assisting lower income countries in developing a low carbon energy sector and energy efficiency remains important. Canada's involvement in finance for low-carbon energy development provides a significant boost to projects that yield mitigation and economic benefits. One area to consider is support for low carbon electricity access and clean cooking initiatives in sub-Saharan Africa, developing South and Southeast Asia, and Latin America (including the Caribbean).[vii]

Adaptation measures

Adaptation measures are very important as they directly reduce the impact of climate change on developing countries. Many nature-based solutions are cross-cutting, offering adaptation and mitigation gains while also benefiting biodiversity and local and indigenous communities and women (see Appendix 2). They thus help fulfill Canada's Sustainable Development Goals (although climate finance should not substitute for official development aid). Poverty alleviation achieved through well implemented NbS programs is an effective means to persuade local people to give up destructive livelihoods in favour of sustainability. Canada should aim to apply at least half of its climate finance assistance for climate adaptation, and this is made easier by applying more finance to nature-based solutions.

The further case for nature-based solutions

Almost two-thirds of the global potential for NbS lies in the tropics. A recent study involving 76 tropical countries found that cost-effective NbS could mitigate more than half of each country's national emissions, and in more than a quarter it could exceed national emissions.[viii] "Cost-effective" was taken in this study as US$100/tonne CO_2e and "low-cost" as <US$10/tonne. There are many untapped low-cost opportunities, most in the tropics. Appendix 2 discusses nature-based solutions in more detail.

Maximizing climate benefits and co-benefits

Key considerations in allocating funds are the priorities of the developing country and cost effectiveness in relation to climate benefits and co-benefits.

We highlight the following as recommended approaches:

- Programs to restore degraded forests, peatlands and coastal mangroves enhance ecosystem resilience and yield negative emissions, removing CO_2 from the atmosphere. Establishing habitat connectivity is one important consideration.
- Programs to reduce the high levels of tropical deforestation yield avoided emissions and are vital in reducing the impact of climate change by protecting regional climate and water regimes and ecosystem benefits to agriculture. Peatlands and intact forests are a particular priority in view of their high carbon storage and biodiversity. Watersheds are also important. Since deforestation exacerbates regional climate change impacts, these programs also benefit adaptation.
- Adaptation can be advanced through water management projects, by restoring degraded land to sustainable agriculture or as natural habitat, and by agricultural NbS (cropland nutrient management, conservation agriculture, trees in croplands, biochar, improved grazing practices).
- Reforestation can help montane regions such as the Andes adapt to climate change while increasing food and water security for highland communities.
- Protecting and restoring coastal ecosystems including mangroves protects coastal areas from storm damage and rising sea levels—an enormous adaptation benefit, and a small "blue carbon" benefit.

How can this be done?

Options include:

- Further contributions to the Green Climate Fund, Least Developed Country Fund, Clean Technology Fund and Adaptation Fund
- Bilateral agreements (see below)
- Results-based REDD+: Any REDD+ projects Canada undertakes should have a rigorous design and a minimum "permanence" of 30 years. The much shorter timeframes preferred by governments do not make sense for REDD+ projects (any more than they would for trade agreements). Participation of local communities on the basis of free, informed and prior consent is essential, as is close attention to environmental and social safeguards. Carbon credits should accrue to country of activity. Canada can learn from the experience of other countries such as Norway[ix,x] and aim for better results.
- Private sector forest carbon firms offer opportunities for large-scale forest carbon projects in the tropics; these can stand alone or be nested within jurisdictional REDD+. Reputable companies tend to be more skilled than governments in applying due diligence in designing effective programs.
- Local/regional and international conservation NGOs and expert funders such as the Andes Amazon Fund offer opportunities to protect and restore tropical ecosystems and have the expertise to work effectively with their governments and communities. Some yield large benefits in avoided emissions along with biodiversity and human livelihoods benefits.
- Canada could complement its conservation partnerships with its First Nations with support for conservation partnerships involving indigenous people in developing countries (see Appendix 2).
- Capacity building assistance: A useful role that Canada is already undertaking is assisting developing countries to build capacity to measure and monitor their forest emissions by using the Canadian Forest Service's Carbon Budget Model software. Governance assistance is also of value in taking account of future climate change to improve project development and planning across sectors. Much deforestation in developing countries is illegal, hence help could be offered in law enforcement, justice, and legal reform, with a focus on Indigenous lands.

Bilateral agreements

Bilateral agreements between Canada and developing countries can apply needed funds to manage and protect existing protected areas, create new ones, reduce deforestation and degradation of natural ecosystems, and undertake ecological restoration. We should particularly reward countries currently prioritizing forest conservation, such as Colombia, Costa Rica, Ecuador, Peru and Indonesia. Brazil holds

60% of the Amazonian rainforest and is always important. The Guyanas (Suriname, French Guiana, and Guyana) are of special interest due to their importance for Canada's wintering shorebirds. Colombia is especially important for Canada's wintering songbirds, as is the Brazilian Amazon. These countries also merit consideration as "high forest low deforestation" (HFLD) countries (something of particular relevance to Canada, perhaps).[1]

Paris Agreement Article 6.2 allows for collaborative approaches between countries in pursuit of their Nationally Determined Contributions (NDCs) to greenhouse gas emission reductions. In contrast to Article 6.4, which would allow for countries to use a marketplace administered by the UNFCCC to exchange emissions reductions/removals and which awaits the establishment of rules, Article 6.2 allows countries now to make bilateral arrangements that involve International Transferred Mitigation Outcomes (ITMOs). This is feasible, given dramatic advances in national-level monitoring, reporting and verification systems and existing means of addressing double-counting, environmental integrity and overall uncertainty.[xi] Pursuing ITMOs does not replace any actions Canada must make domestically but recognizes that Canada is unlikely to meet its NDC targets without this additional avenue. Indeed, Canada needs to accelerate progress on reducing domestic emissions.

Potential carbon benefits

With respect to natural climate solution projects, US$1.45 billion (half the recommended contribution) applied at a cost of US$10/tonne CO_2e would reduce global CO_2e net emissions by 145 Mt. If applied at US$5/tonne (which forest carbon projects in the tropics now offer), the emissions reduction would be 290 Mt – equal to a 40 percent of Canada's total annual greenhouse gas emissions.

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[1] High-forest low-deforestation (HFLD) countries are an overlooked option. These countries contain approximately 24% of the world's remaining forests and are custodians of diverse ecosystems, rich biodiversity and a large proportion of forest carbon. HFLD developing countries have received a small portion of climate finance and maintain that they are "in dire need" of international climate finance, technology transfer and capacity building to achieve sustainable development goals and the goals of the Paris Agreement.

Appendix 1: Responses from ICFC to the government's key questions on Canada's International Climate Finance

1. What are some of the most important issues or areas where the Government of Canada could focus when it comes to financing climate change adaptation and mitigation in developing countries?

    1. nature-based climate solutions
    2. low-carbon energy development and energy efficiency (but this is not our area of expertise)

2. For each issue or area that you identified, how can Canadian support make the biggest difference?

    1. See *Appendix 2: Nature-based solutions: why and how*.

3. In your view, what has been the most successful in the design and implementation of the Government of Canada's current climate finance package ($2.65 billion committed over five years)? What lessons should be drawn from the past five years in developing our next package?

    We feel we don't know enough to comment on this. It would be helpful if Global Affairs Canada were to post more up-to-date information on climate finance projects it has funded.

4. Building on its experience since 2016, what should be the principles that define the Government of Canada's public climate finance contribution for the post-2020 period?

    - Cost-effectiveness: climate benefits and co-benefits in relation to cost and risk
    - Priorities of the developing countries in which projects are undertaken
    - Having a mix of programs all of which are strong in yielding climate mitigation and/or adaptation benefits, but which are allowed to vary in terms of co-benefits. For example, some may yield poverty reduction benefits, some ecosystem services benefits other than climate (e.g. water conservation and filtration; improved agricultural output) and some biodiversity conservation benefits.
    - There is an important role for the private sector to ensure that climate mitigation work is cost effective. Given that the timeframe of program implementation tends to be long in relation to government timeframes, it makes sense to look for existing programs to join that are already producing credible independently audited results
    - Protection of human rights, and in particular land rights of Indigenous people and vulnerable rural communities, irrespective of existing legal title.

5. How can the Government of Canada best support Indigenous-led climate action, recognizing Indigenous Peoples' rights and distinct voices, and the valuable contribution and knowledge Indigenous Peoples have in understanding the environment and tackling climate change?

    This could be done through non-governmental organizations that work with Indigenous People in developing countries to support nature conservation, sustainable livelihoods, land rights and payments for ecosystem services. This includes our organization, but the government should look beyond Canada-based organizations for this. Indigenous people are indeed important allies in conserving natural ecosystems in developing countries. And it's not just their knowledge: Indigenous people in the Amazon and elsewhere of their own volition are placing their lives on the line in defending against illegal incursions and deforestation of their land. Studies have shown that

Indigenous territories resist deforestation even better than public protected areas. See Appendix 3 for ICFC's perspective on working with Indigenous people in developing countries.

How can the government leverage Canada's strengths, including those of the private sector, in order to achieve the greatest benefits of international climate finance?

Some Canadian conservation charities have programs that conserve and restore tropical ecosystems and that yield large climate benefits. The largest player in this regard is our organization.

6. How can the Government of Canada continue to promote gender equality through its international climate finance? What does a feminist approach to climate finance entail?

   Especially with respect to adaptation, gender equality is important, since poor, rural women in developing countries are generally the ones tasked with providing food, cooking fuel (wood) and water for their families. All of these, which are necessary for survival, are at risk in a warming world, and it makes sense to put these women on the front lines, with both the most to lose but also the best opportunities to make a change to sustainable use.

7. Considering the intersection between women's rights and climate adaptation, how can the Government of Canada be more effective in supporting sustainable and equitable resource management, agricultural production and access to markets?

   We believe this is best accomplished through a range of nature-based solutions, and through education and empowerment of girls and women, which results in wiser decisions and improvements in sustainability.

8. How should the Government of Canada align international climate finance to respond to the impacts and priorities emerging from the COVID-19 global pandemic?

   By giving extra weight to programs that reduce threats to natural ecosystems. And by working with communities living in proximity to natural ecosystems to encourage a sustainable local economy. Wildlife crime is unsustainable and is often associated with other illegal activities like logging in natural forests.

9. How can the Government of Canada's climate finance support community resiliency as part of efforts to empower the furthest behind, support community-based solutions, build back better and prepare for future crises?

   By supporting projects involving community management/co-management of forests or marine protected areas/marine fisheries management areas. Non-governmental organizations are involved in such work. For example, our organization works with local communities in nearly all our projects.

Appendix 2: Nature-based solutions: why and how

Rationale

Need for negative emissions

- All pathways that limit global warming to 1.5°C with limited or no overshoot project the use of carbon dioxide *removal* on the order of 100–1000 Gt (gigatonne) of CO_2 over the 21st century.[xii] Most 2-degree scenarios also rely on negative emissions; many call for removing billions of tons of CO_2 per year by mid-century.[xiii,xiv]
- Negative emissions technologies are decades from maturity – too long to wait.
- To avoid catastrophic climate change, aggressive reduction of fossil fuel emissions and negative emissions measures are *both* required. Reducing fossil fuel emissions must remain the priority for developed countries (and China). By contrast, developing countries have low fossil fuel emissions and many offer opportunities for negative emissions through nature-based solutions.

Nature-based solutions potential

- Natural climate solutions can help the world achieve 37 percent of the Paris Climate Agreement target through 2030,[xv] yet as of 2015 they were receiving only 2.8 percent of public climate financing.[xvi]
- Half the potential cost-effective NbS mitigation entails negative emissions (additional carbon sequestration). *We have no other means now to generate negative emissions on this scale.*
- NbS improves climate resilience and adaptation, providing water filtration, flood buffering, soil health, biodiversity conservation, and other co-benefits. These are very important to local communities.
- On cost, NbS compares very well with other emissions abatement measures.[xvii]

Prioritizing NbS actions

- **Forest climate mitigation options** offer over two-thirds of the cost-effective NbS needed to hold warming to below 2°C.[xv]
- **Tropical forests** exceed temperate and boreal forests in their potential for sequestration;[xv] and tropical deforestation results in large greenhouse gas emissions.[2,xviii]
- **Preventing deforestation and forest degradation** is more cost effective than reforestation and afforestation and yields greater benefits for biodiversity conservation.
- **Protecting primary forests** is a priority, as they:
    - store 30–70% more carbon than logged and degraded forests[xix,xx,xxi]
    - have very high biodiversity value[xxii]
    - are still being lost[3,xxiii]
- **Peatlands** represent large terrestrial carbon banks; conserving and restoring peatlands is a top priority.
- **Mangroves** provide nurseries for juvenile fish, stabilize and protect shorelines from storm damage, prevent erosion, and filter pollutants.

[2] Also, the increased absorption of solar energy (decreased albedo) of forests reduces the climate benefit of higher latitude and higher altitude forests but with tropical forests is more than offset by the cooling effects of massive evapotranspiration and cloud formation.

[3] Intact forest has been reduced by 7.2% since 2000, with three times greater losses between 2011-2013 compared to 2000-2003[xiv]

- Among ecosystem restoration measures, **natural regeneration** is the most cost effective in increasing ecosystem services (carbon storage, soil attributes and biodiversity protection) compared with agroforestry, nucleation,[4] and reforestation with native or exotic species.[xxiv]
- **Reforestation** offers an opportunity for very large-scale climate mitigation. Over 2 billion ha of deforested and degraded land provide opportunities for forest landscape restoration around the world.[xxv] However **timing is key:** current forest losses are effectively irreversible from a climate perspective. With every hectare of forest cleared, more carbon is released into the atmosphere and nature's capacity to absorb carbon is reduced. Restoring the carbon stock of cleared forests requires a time scale measured in decades, while the time frame to avoid catastrophic climate change is measured in years.[xviii] . Thus, while reforestation is important and worthwhile, it should not displace measures to curtail ecosystem loss. Nor is it as beneficial as allowing degraded forest to recover.
- **Bottom line: Tropical forest protection is the most urgent NbS priority.**

Measurement technologies: Technological advances give us the low-cost ability to monitor forest carbon change, improving the efficacy of results-based payment schemes like REDD+. The Canadian Forest Service is a world leader in modeling all forest carbon stocks required under the Kyoto Protocol and has developed user-friendly software that it provides for free. It has also been building capacity to use this tool in several developing countries.

Adaptation

NbS is a cost-effective approach to advance climate adaption. Coastal conservation and restoration is crucial for protecting coastal communities and infrastructure from higher sea levels and increased intensity of coastal storms. Forests, grasslands and wetlands all reduce flooding, hence targeted restoration is another priority along with protection. Tropical forests are crucial for cloud formation and their importance in the hydrological cycle becomes even more important to minimize droughts that are now more frequent. Agricultural systems also become more dependent on adjacent natural ecosystems in resisting climate change effects. Connecting natural ecosystems through strategic restoration will allow for movement of pollinators and birds and bats and predatory insects that control insect pests. Integration of trees and natural ecosystems in agricultural lands improves soil and water conservation.

> *"Action to protect, enhance, or restore carbon stocks can improve habitat, reduce the risk of catastrophic wildfires, increase soil fertility and water-holding capacity, and decrease air and water pollution. In some places, the co-benefits of [natural climate solutions] may be more valuable than the carbon mitigation benefit."*
> -- Anderson et al. 2019[xxvi]

Human benefits

- **Local communities and indigenous people** are important partners and beneficiaries in conservation.
- Traditional indigenous territories encompass up to 22 percent of the world's land surface and hold 80 percent of the planet's biodiversity, according to a World Bank study,[xxvii] which included the comment that engaging indigenous peoples in biodiversity conservation represents a "win-win situation." In the Brazilian Amazon, Indigenous lands were found to be particularly effective at curbing high deforestation pressure, relative to both strictly protected and sustainable use areas.[xxviii] See Appendix 3 for ICFC's perspective on working with Indigenous people in developing countries.

[4] Nucleation refers to establishing small patches of vegetation on degraded land.

- **Sustainable Development Goals:** Some 240 million people live in forested regions, and in developing countries, forest-based activities provide about 30 million jobs in the informal sector, as well as up to one-third of all rural non-farm employment.[xxix] On average, rural communities in and around forests derive more than one-fifth of household income from gathering wild forest products, such as fuelwood, food, and medicinal plants.[xviii] Forested watersheds supply water for irrigating agricultural crops, generating hydroelectric power, and providing clean drinking water and sanitation. Intact forest vegetation increases resilience to the impacts of extreme weather events such as landslides and coastal storm surges. Forests thus contribute to health and safety as well as to food and energy security. Forest NbS initiatives address many Sustainable Development Goals (1, 2, 3, 6, 8, 10, 12, 13, 15).

Biodiversity benefits

- The world is entering a sixth mass extinction, as evidenced by much higher extinction rates compared with normal "background" rates.[xxx] This can still be largely or partially averted through intensified conservation efforts.
- Tropical ecosystems support most of the Earth's species and this is where nature is most under threat.
- **Canada's migratory birds:** Many of Canada's breeding birds spend more time in the Neotropics – Latin America including the Caribbean – than in Canada. Populations are undergoing a "steep decline" for 31 bird species wintering in South America,[xxxi] where habitat loss is ongoing.
- Under the **Convention on Biological Diversity**, Canada committed to assisting developing countries with biodiversity conservation. Canada also committed to the UN Sustainable Development Goal 15, which pledges to protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss. Nature-based solutions represent effective action in fulfilling these commitments.

Appendix 3: Comments based on ICFC's experience in working with indigenous people in developing countries.

We noted earlier the huge potential for partnering with indigenous people in conserving natural ecosystems, and hence the potential for nature-based climate solutions.

How can Canada help?

In theory, Canada could find a country (Colombia might be a candidate) that supports indigenous land rights and would welcome financial aid to do more to protect indigenous lands. In practice, however, in developing countries indigenous people are largely left to fend for themselves in protecting their land, whether ratified Indigenous Territories or traditional territories.

The best opportunities lie with NGOs that are indigenous or work with indigenous people. This includes conservation organizations like ours and civil society organizations that work for land rights, which is known to advance forest conservation.[xxxii] Examples of the latter are IWGIA, which works around the world, Amazon Conservation Team, which works in Colombia, Suriname and Brazil, and CEDIA *(Centro para el Desarrollo del Indígena Amazónico)*, which works in the Amazon.

Since 2009 ICFC has been the lead international partner in a conservation alliance with the Kayapo Indigenous People, whose ratified territories span 10.5 million hectares in the Brazilian Amazon. This is an area twice the size of Nova Scotia. This alliance was pioneered by the Canadian Barbara Zimmerman three decades ago, just as the tide of advancing deforestation and colonization was reaching them. The alliance has enabled the Kayapo to continue protect their lands against illegal incursions for goldmining, logging and land clearing for agriculture. The keys to this project's success are set out in a recent publication.[xxxiii]

ICFC also works or has worked with indigenous communities in Bolivia, Mozambique and the Democratic Republic of Congo. Currently, we are developing a project with the Wounaan indigenous people in Panama. In Peru, ICFC plays a key role in the Los Amigos Conservation Concession, which directly and indirectly protects one million hectares and uncontacted indigenous people in voluntary isolation.

From our perspective, NGOs are able to take a personal, non-bureaucratic, practical approach to working with indigenous people. Building trust and relationships takes time and it is important that conservation partnerships with indigenous people are not constrained by an unrealistic timeframe. Indigenous people must be true partners – involved in decision making, respected and empowered.

Our attention in the Kayapo Project has been to three aspects: assisting the Kayapo with surveillance and protection of their lands and their traditional way of life; developing culturally compatible sustainable livelihoods; and building the capacity of our Kayapo NGO partners. We are succeeding, despite severe challenges.

With the Kayapo Project, our aim has been the conservation of the Amazon's rich biodiversity. Co-benefits have been the safeguarding of the Kayapo's way of life and large-scale carbon benefits, which our conservative back-of-envelope calculations indicate cost a few cents per tonne of avoided CO_2e emissions.

Notes

[i] Canada committed $600 million to the Green Climate Fund (GCF), which has approved climate projects involving nature-based solutions. Notably, in its past climate finance commitment, in 2011-2012, Canada provided $20 million through the African Development Bank to the Congo Basin Forest Fund aimed at reducing, slowing and eventually reversing the rate of deforestation in the Congo Basin region.

[ii] Calculated using data from "Our World in Data", which is based on Global Carbon Project; Carbon Dioxide Information Analysis Centre; BP; Maddison; UNWPP. https://ourworldindata.org/contributed-most-global-co2

[iii] OECD (2019) Climate Finance Provided and Mobilised by Developed Countries in 2013-17. http://oe.cd/cf-2013-17

[iv] Yeo, S. 2019. Climate finance: the money trail. Nature 573:328-331.

[v] International Energy Agency website (Aug. 2020). https://www.iea.org/topics/energy-subsidies

[vi] Food and Land Use Coalition. 2019. Growing Better: Ten Critical Transitions to Transform Food and Land Use. https://www.foodandlandusecoalition.org/global-report/

[vii] Several important international initiatives are now being launched that offer convenient and well-informed channels for climate finance. Specifically, the Universal Electrification Facility (UEF) proposed by the UN's SEforAll initiative seeks to establish a pool of concessional capital from donor countries such as Canada to offset the high initial capital cost of solar microgrids in developing countries with low levels of electricity access. The leadership of SEforAll is working with the Rockefeller Foundation-funded Global Commission to End Energy Poverty, along with the World Bank and Africa Development Bank. The combined initiative seeks to bring about universal electrification rapidly while eschewing greenhouse gas emitting technologies.

[viii] Griscom, B.W., et al. 2020. National mitigation potential from natural climate solutions in the tropics. *Philosophical Transactions of the Royal Society B*, 375, 20190126.

[ix] The Office of the Auditor General of Norway's investigation of Norway's International Climate and Forest Initiative. (2018)

[x] Roopsinda, A., B. Sohngenb, and J. Brandt. 2019. Evidence that a national REDD+ program reduces tree cover loss and carbon emissions in a high forest cover, low deforestation country. PNAS 116(49):24493-24499.

[xi] Adkins, B. 2020. Pathways to Operationalising the Paris Agreement's Article 6.2: Time to Act. https://flintpro.com/pathways-to-operationalising-the-paris-agreement

[xii] IPCC (2018). Global Warming of 1.5°C. https://www.ipcc.ch/sr15/

[xiii] Elizabeth Kolbert in Yale 360, (2018) Climate Solutions: Is It Feasible to Remove Enough CO_2 from the Air?

[xiv] Hansen, J., et al. 2017. Young people's burden: requirement of negative CO2 emissions, Earth Syst. Dynam., 8, 577-616, https://doi.org/10.5194/esd-8-577-2017.

[xv] Griscom et al. (2017) Natural Climate Solutions. Proceedings of the National Academy of Sciences, 114 (44) 11645-11650; DOI: 10.1073/pnas.1710465114.
This major study published quantified 20 conservation, restoration, and improved land management pathways that increase carbon storage and/or avoid greenhouse gas emissions across global forests, wetlands, grasslands, and agricultural lands. In the analysis, the potential of NbS was significant even when constrained by food and fiber security and biodiversity conservation. It also assumed accelerated carbon emissions reductions.

[xvi] Buchner BK, et al. 2015 Global landscape of climate finance 2015. Available at https://climatepolicyinitiative.org/publication/global-landscape-of-climate-finance-2015/

[xvii] Kenneth Gillingham and James H. Stock. 2018. The Cost of Reducing Greenhouse Gas Emissions. Forthcoming, Journal of Economic Perspectives.

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[xxi] Carlson, M., Chen, J., Elgie, S., Henschel, C., Montenegro, A., Roulet, N., Scott, N., Tarnocai, C., & Wells, J. 2010. Maintaining the roles of Canada's forests and peatlands in climate regulation. The Forestry Chronicle, 86: 1-10.

[xxii] Gibson, L. et al. 2011. Primary forests are irreplaceable for sustaining tropical biodiversity. Nature 478: 378–381.

[xxiii] Potapov, P. et al. 2017. The last frontiers of wilderness: Tracking loss of intact forest landscapes from 2000 to 2013. Sci. Adv. 3, e1600821

[xxiv] Shimamoto, C.Y. et al. 2018. Restoration of ecosystem services in tropical forests: A global meta-analysis. PLoS ONE 13(12): e0208523. https://doi.org/ 10.1371/journal.pone.0208523

[xxv] Chazdon, R.L. 2017. Landscape restoration, natural regeneration, and the forests of the future. Ann. Missouri Bot. Gard. 102:252-257.

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[xxvii] C. Sobrevila, 2008. The role of indigenous peoples in biodiversity conservation: the natural but often forgotten partners. The World Bank, 102 pp.

[xxviii] Nolte, C. et al. 2013. Governance regime and location influence avoided deforestation success of protected areas in the Brazilian Amazon. Proceedings of the National Academy of Sciences of the United States of America. 110. 10.1073/pnas.1214786110.

[xxix] Center for International Forestry Research website (2020)

[xxx] Ceballos, G., P. R. Ehrlich, A.D. Barnosky, A. García, R.M. Pringle, T. M. Palmer. 2015. Accelerated modern human–induced species losses: Entering the sixth mass extinction. Sci.Adv. 1, e1400253

[xxxi] Environment and Climate Change Canada website. Status of Canada's migratory bird populations within each primary wintering area, 1970-2010. https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/trends-migratory-bird-populations.html

[xxxii] Blackman, A. L. et al. 2017. Titling indigenous communities protects forests in the Peruvian Amazon. PNAS. 114 (16): 4123–4128. www pnas.org/cgi/doi/10.1073/pnas.1603290114

[xxxiii] Zimmerman, B., Schwartzman, S., Jerozolimski, A., Esllei, J., Santini, E., Hugh, S., 2020. Large Scale Forest Conservation with an Indigenous People in the Highly Threatened Southeastern Amazon of Brazil: The Kayapo. In: Goldstein, M.I., DellaSala, D.A. (Eds.), Encyclopedia of the World's Biomes, vol. 3. Elsevier, pp. 27–34. ISBN: 9780128160961