





The COVID-19 socio-economic crisis and UN-REDD: catalysing COVID-19 recovery responses through forest solutions

Discussion paper

November 2020

Table of Contents

ntroduction	3
Objective	. 3
Structure of the Paper	3
Methodology	. 3
Section 1. The challenge: COVID-19 crisis and ongoing global societal challenges	5
1.1. Limited progress in addressing the climate and biodiversity crisis, and the Sustainable Development Goals, has both contributed to -and is being further constrained by- zoonotic pandemics as the COVID-19	. 5
1.2. The economic shock and early recovery approaches in developing forest countries.	6
Section 2. The opportunity: REDD+ is a shovel-ready forest solution, catalyst for a greener nore resilient and sustainable post-pandemic world1	-
2.1. Harnessing the potential of forest, other ecosystems and landscapes to accelerate global responses to the climate and COVID-19 socio-economic crisis	l0
2.2. Forest solutions as an integral part of the COVID-19 recovery process	l 1
2.3. The opportunity to leverage the right scale of financing to harness forest solutions in support of COVID-19 recovery responses	
2.4. REDD+ is a shovel-ready climate forest solution	15
2.5. COVID-19 socio-economic recovery responses represent a use-it-or-lose-it window of opportunity to a build greener, more resilient and sustainable world consistent with the Paris Agreement	
Section 3. UN-REDD's strategic priorities for building a better, greener, more resilient post pandemic world2	
3.1. Harnessing the realization of forest solutions while fostering greener, more resilier and sustainable rural livelihoods	
3.2. Accelerating forest solutions rewards and leveraging forest carbon-based financing to support the COVID-19 socio-economic recovery	_
3.3. Enhancing forest solutions to address the climate crisis and prevent future zoonotic pandemics	
3.4. Connecting actors and knowledge to foster a better, greener, more resilient and sustainable world through forest solutions	26
Section 4. Next steps: An integrated UN-REDD COVID-19 path	28
Bibliography	29

Introduction

Objective

The purpose of this paper is to inform discussions of the UN-REDD's Programme Executive Board (EB), as well as inform the implementation of UN-REDD's 2021 Workplan and its 2021-2025 Results Framework, with regards to the challenges and opportunities that the socio-economic recovery to the COVID-19 pandemic represent for harnessing the potential of forest solutions -through REDD+- for building back better¹ greener, more resilient and sustainable rural societies, ecosystems, economies.

This discussion paper explores the interplay between forest loss and degradation and the root causes of the COVID-19 pandemic, and the role that forest solutions -as REDD+- can play in cost-effective and multidimensional post-pandemic policy and economic responses. It further examines strategic opportunities and priorities, and a course of action, for the UN-REDD Programme to contribute to the green recovery process through scaling up and accelerating its technical assistance that realise the potential of forest solutions. Thus, contributing to simultaneously achieve global climate objectives while safeguarding biodiversity and strengthening rural economies, and contributing to the achievement of the Sustainable Development Goals.

Structure of the Paper

This discussion paper is structured as follows:

Section 1: provides the framing of the paper, by offering an overview on the environmental root causes of the of the COVID-19 pandemic, the social and economic distress resulting from the pandemic, and the challenges posed to the climate change and forest conservation global objectives;

Section 2: presents an overview on the opportunities that forest solutions provide -through REDD+- to maximize the social, environmental and economic benefits resulting from COVID-19 recovery responses in forest developing countries;

Section 3: presents an overview on the strategic opportunities and priorities for the UN-REDD Programme to articulate its work with COVID-19 recovery responses that promote a better, greener and more resilient world;

Section 4: Summarizes the findings of the discussion paper and identifies opportunities for the UN-REDD Programme to integrate COVID-19 response and recovery approaches into planning, operations, and fundraising instruments, ensuring alignment to the socio-economic recovery to the COVID-19 pandemic.

Methodology

This paper has been prepared through mix methods approach: desk-based review and semi structured interviews with representatives of forest countries, donor countries and civil society, particularly the members of UN-REDD's Executive Board.

 $^{^{1}}$ United Nations, 2020, A UN Framework for the immediate socio-economic response to COVID-19, pag. 38.

The desk-based review considered literature and evidence available, including scientific papers, news outlets, policy and planning documents from governments, multilateral and international financing institutions, and other audio-visual resources available. The latter particularly considered a broad array of webinars and online audio resources by development and/or environmental organizations, academia and other platforms in the context of the COVID-19 pandemic and the environmental and climate agendas.

Key informant interviews (KIIs) have represented a key source of information with regards to perspectives, needs and priorities from forest developing countries, donor countries and civil society regarding the integration of the forest and climate change agenda in socio-economic recovery packages in the absence of official information on said recovery packages to the date of writing of this paper, and that are being defined. The full list of KIIs is included in Annex 1.

It is worth noting that this paper has been developed in close coordination with the UN-REDD Programme Secretariat as well as with the inter-agency COVID Working Group, Annex 2, in alignment with UN-REDD's 2021 Technical Assistance Workplan and it 2021-2025 draft Results Framework, with a vision 2030.

Section 1. The challenge: COVID-19 crisis and ongoing global societal challenges

This section provides an overview on the environmental root causes of the COVID-19 pandemic and the threat that the socio-economic distress of the pandemic can pose to achieving global sustainable development and environmental objectives. In doing so, this section further examines the challenges that forest developing countries are already facing and the long-term social, economic and environmental impacts that could result from the aftermath of the pandemic, if economic and policy responses to the recovery to the COVID-19 pandemic fail to address simultaneously social inequalities as well as the environmental and climate crisis.

1.1. Limited progress in addressing the climate and biodiversity crisis, and the Sustainable Development Goals, has both contributed to -and is being further constrained by-zoonotic pandemics as the COVID-19

The lack of collective international action to address global societal challenges² – including the climate and biodiversity emergencies and the Sustainable Development Goals (SDGs') - has made societies and economies more vulnerable to the pandemic than it should have been.³

On the one hand, the slow progress in halting forest loss and degradation together with increased pressure in primary forests and other ecosystems, and their biodiversity, for either land use changes or demand for wildlife for human consumption, are known to be some of the 'root causes of the emergence and spread of the novel coronavirus.' About 60 percent of human infections are considered to have animal origin, with up to 75 per cent of emerging human infections 'jumping from other animals to people', and some being described as transmitted via food systems. Increased pressure on forests and other ecosystems for both unsustainable land uses or infrastructure purposes together with climate change are some of the *human-mediated factors* driving the emergence of zoonotic diseases, and thus increasing the risk to future pandemics.

On the other hand, the lack of collective international action to address global societal challenges⁷ – including achieving the global environmental and sustainable development objectives under the Paris Agreement and the SDGs- has made societies and economies more vulnerable to the pandemic than it should have been.⁸

² Cohen-Shacham, E., Walters, G., Janzen, C. and Maginnis, S. (eds.) (2016). *Nature-based Solutions to address global societal challenges*. Gland, Switzerland: IUCN.

³ United Nations, 2020, A UN Framework for the immediate socio-economic response to COVID-19

⁴ United Nations Environment Programme and International Livestock Research Institute (2020). Preventing the Next Pandemic: Zoonotic diseases and how to break the chain of transmission. Nairobi, Kenya.

⁵ United Nations Environment Programme and International Livestock Research Institute (2020). Preventing the Next Pandemic: Zoonotic diseases and how to break the chain of transmission. Nairobi, Kenya.

⁶ Hahn MB, Gurley ES, Epstein JH, Islam MS, Patz JA, Daszak P, Luby SP. 2014The role of landscape composition and configuration on *Pteropus giganteus* roosting ecology and Nipah virus spillover risk in Bangladesh. *Am. J. Trop. Med. Hyg.* 90, 247-255. Rulli MC, Santini M, Hayman DTS, D'Odorico P. 2017The nexus between forest fragmentation in Africa and Ebola virus disease outbreaks. *Sci. Rep.* 7, 41613.

⁷ Cohen-Shacham, E., Walters, G., Janzen, C. and Maginnis, S. (eds.) (2016). *Nature-based Solutions to address global societal challenges*. Gland, Switzerland: IUCN.

⁸ United Nations, 2020, A UN Framework for the immediate socio-economic response to COVID-19

About a third of the population has faced some type of lockdown and restrictions resulting in a simultaneous social and economic shock across countries, exacerbating and deepening preexisting inequalities, exposing vulnerabilities in social, political, economic, and biodiversity systems, which are in turn can increase the risk to future zoonotic pandemics.⁹

The socio-economic distress resulting from the COVID-19 pandemic is now exacerbating and deepening pre-existing inequalities, exposing vulnerabilities in social, political, economic, and biodiversity systems, which are in turn amplifying the impacts of the pandemic. ¹⁰ From 1990 until last year the number of extremely poor people—those who subsist on less than \$1.90 per day—fell from 36% of the world's population, to around 8%. Now, for the first time since 1998, that number is rising—very fast. 11 Is expected that half a billion people could be pushed into poverty. 12 Almost 1.6 billion informal economy workers -nearly half the global workforce – are being significantly impacted, leading to a 60 percent decline in their earnings. ¹³ Global human development -measured as a combination of education, health and living standards- 'is on course to decline this year, for the first time since 1990, when the concept was developed.

1.2. The economic shock and early recovery approaches in developing forest countries

With a third of the population around the world under lockdown and facing restrictions on both economic activity and mobilization, financial stimulus to address the shock and long-term socio-economic impacts of the pandemic are urgent. In countries where social safety nets are traditionally weak, the pandemic constitutes not only a health crisis but also a jobs and livelihoods crisis, leading to increased unemployment, poverty and food insecurity', exacerbating already high levels of inequality within and between countries. 1516

During socio-economic shocks in normal times, when crisis is not striking everywhere at oncecoping mechanisms would be available. The COVID-19 pandemic, however, has resulted in 'simultaneous and massive economic shock' across the world. 17

Developing countries are already facing a series of economic and development set-backs as the immediate socio-economic impact from the COVID-19 pandemic, with 700 million people already living in extreme poverty and 1.3 billion without access to basic needs. 18 As noted above, it is estimated that 49 million people will be pushed into extreme poverty, where in most

⁹ United Nations, 2020, A UN Framework for the immediate socio-economic response to COVID-19, Pg 3

 $^{^{10}}$ United Nations, 2020, A UN Framework for the immediate socio-economic response to COVID-19, Pg 3

¹¹ The Economist-THE GREAT REVERSAL, https://www.economist.com/international/2020/05/23/covid-19-is-undoing-years-of-progressin-curbing-global-poverty

¹² Half a billion people could be pushed into poverty as a result of the COVID-19 crisis. April 2020. https://www.oxfam.org/en/pressreleases/half-billion-people-could-be-pushed-poverty-coronavirus-warns-oxfam

¹³ International Labour Organization – ILO, 2020. The impact of COVID-19 on the informal economy. May. https://www.ilo.org/global/about $the \hbox{-ilo/multimedia/video/institutional-videos/WCMS_744256/lang--en/index.htm}$

¹⁴ UNDP. May 2020. COVID-19: Human development on course to decline this year for the first time since 1990. Access: https://www.undp.org/content/undp/en/home/news-

centre/news/2020/COVID19_Human_development_on_course_to_decline_for_the_first_time_since_1990.html ¹⁵ FAO. 2020. *The impacts of COVID-19 on the forestry sector: How to respond?* Rome.

Accessed at: http://www.fao.org/3/ca8844en/CA8844EN.pdf

¹⁶ The Economist. (2020). 'The Great Reversal: COVID-19 is undoing years of progress in curbing global poverty.' May, Accessed at: https://www.economist.com/international/2020/05/23/covid-19-is-undoing-years-of-progress-in-curbing-global-poverty

¹⁷ The Economist. (2020). 'The Great Reversal: COVID-19 is undoing years of progress in curbing global poverty.' May. Accessed at: https://www.economist.com/international/2020/05/23/covid-19-is-undoing-years-of-progress-in-curbing-global-poverty

¹⁸ UN. (2020) "Shared Responsibility, global solidarity: responding to the socio-economic impacts of COVID-19. March. Pg. 22 Accessed at https://unsdg.un.org/sites/default/files/2020-03/SG-Report-Socio-Economic-Impact-of-Covid19.pdf

cases forests and ecosystems as immediate resources for subsistence livelihoods. Generating jobs and addressing financial loses across sectors of the economy gains particular relevance in middle income tropical and subtropical countries, where existing social safety nets are not enough to compensate for the income losses of informal labour. Amongst the main economic and development setbacks caused by the pandemic that forest countries are facing according to KIIs, include:

- Weakened law enforcement, increased illegal activities, land grabbing and deregulation and/or relaxation of environmental laws in forests landscapes and protected areas. In regions with strong governance structures and monitoring systems in place, movement restrictions have resulted in reduced illegal logging or hunting, with a temporarily positive impact on forests and ecosystems. Yet, KIIs broadly agree on increasing constraints to law enforcement and the fight against illegal activities in rural areas with weaker governance structures. ¹⁹ Similarly, there are increasing concerns on deregulation and relaxation of environmental in favour of extractive or land-intensive economic activities, ²⁰ posing a threat to advancements achieved in halting deforestation and ecosystem and biodiversity loss.
- Reverse migration from cities to rural areas and the expected return of millions of migrant overseas' workers to home countries. Estimates suggest that 'remittances from migrant workers will drop by 20% in 2020. By May 2020, Nepali male migrants who have not yet returned to Nepal are sending remittances of only a quarter of what they did in January. ²¹ Between 1.5 million and 2 billion Nepali migrant workers are expected to return back home as demand for their labour has collapsed overseas. This in turn represents a liability for the governmental response to the pandemic; in addition to economic losses from reduced remittances now the government will have to create new jobs for a larger number of unemployed people. Economic growth in Nepal in 2019 was of 7% of the GDP, this year it is expected to go down to 2.3%.

COVID-19 related reverse migration, from cities to rural areas, is also putting pressure on forests and ecosystems as immediate resources for subsistence livelihoods. Forests and non-timber forest products provide immediate sources of cash, subsistence activities -including agriculture-, energy provision and other unplanned activities as *legal livelihoods are lost*.²² Conversely, movement and activity restrictions have impacted the forest-based industries, at all scales in different regions, as both production and trade of timber and non-timber products has been put on hold, threating forest-dependent livelihoods. It is estimated that 75 percent of forest production is informal, between 80-90 percent of forest-based enterprises are small and micro scale,

Accessed at: http://www.fao.org/3/ca8844en/CA8844EN.pdf

¹⁹ FAO. 2020. The impacts of COVID-19 on the forestry sector: How to respond? Rome.

²⁰ Gonzales, J. (2020). 'Brazil minister advises using COVID-19 to distract from Amazon deregulation.' Mongabay. Accessed at: https://news.mongabay.com/2020/05/brazil-minister-advises-using-covid-19-to-distract-from-amazon-deregulation/

²¹ The Economist. (2020). 'The Great Reversal: COVID-19 is undoing years of progress in curbing global poverty.' May. Accessed at: https://www.economist.com/international/2020/05/23/covid-19-is-undoing-years-of-progress-in-curbing-global-poverty

²² FAO. 2020. The impacts of COVID-19 on the forestry sector: How to respond? Rome.

- and about 400 million people worldwide depend of both formal and informal forest-based employment.²³
- Impacts on forest-dependent livelihoods and loss of income sources. One-third of the world population has a close dependence on forests and forests products. Around 280 million people live in tropical forests or savannahs and it is estimated that 1.2 billion people are dependent to agroforestry farming systems. Another in Asia, approximately 100 million people depend on micro-scale forest enterprises and non-timber forest products for *food*, *shelter*, *medicine and cash* yet, about 60 percent of the annual collection of NTFP in the region might have been lost as a result of the COVID-19 pandemic, with collection season having overlapped with strict lockdowns between April and June. Of the 22 million logs to be collected during this fiscal year in Nepal, only 10 million were collected, And the same is true for NTFP as medicinal and aromatic plants, which not only could not be collected but could not be exported to their main markets in America and EU.

KII's broadly agree that both agriculture and forest-based activities are likely to be considered in 2021 budgets, and thus in COVID-19 related economic stimulus and recovery packages give their role in the economy. Still, there is a significant risk that socio-economic recovery results in increased pressure in forests and ecosystems if not designed in a way that social, economic and environmental benefits are integrated to achieve a green recovery while supporting existing environmental, climate and development objectives.

As noted by the UN Environment Assembly, there is a growing interest for a greater focus on a limited number of transformative action areas, building on existing commitments and feeding into COVID-19 economic recovery plans. Designing nature-positive stimulus packages, through integrated and more holistic landscape interventions, could hold the key to a successful economic recovery, that helps tackle global societal challenges, whilst ensuring the long-term sustainability of livelihoods and business activities.

Evidence suggests that reducing pressure in nature by promoting more integrated landscape approaches, increased sustainable land use practices and optimizing production and consumption practices, including eliminating deforestation from supply chain -all currently encompassed in REDD+ national strategies or action plans, are not only crucial to achieve the global climate, biodiversity and sustainable development goals, but also are likely to mitigate the risk of future pandemics. Yet, as governmental environmental agencies and citizens struggle to integrate climate, environmental and development priorities into said recovery packages, pressing economic needs can put at risk progress and ambitious public and private efforts to halt forests and ecosystems loss and degradation -including

Accessed at: http://www.fao.org/3/ca8844en/CA8844EN.pdf

²³ FAO. 2020. The impacts of COVID-19 on the forestry sector: How to respond? Rome.

²⁴ FAO and UNEP. 2020. The State of the World's Forests 2020. Forests Biodiversity and people. Rome. Accessed at: http://www.fao.org/3/ca8642en/CA8642EN.pdf

²⁵ Forest Rights groups, researchers and experts write to the Ministry of Tribal Affairs in India. (2020). 'Impact of COVID-19 Outbreak and Lockdown Measures on Tribal and Forest Dwellers (A Preliminary Report)'. Access: https://www.groundxero.in/2020/05/07/a-report-on-the-covid-lockdown-impact-on-tribal-communities-in-india/

²⁶ Pinner, D., Rogers, M., Samandari, H. (2020). 'Addressing climate changes in a post-pandemic world: The coronavirus crisis holds profound lessons that can help us address climate change-if we make greater economic and environmental resiliency core to our planning for the recovery.' McKinsey Quaterly. April. Accessed at: https://www.mckinsey.com/business-functions/sustainability/our-insights/addressing-climate-change-in-a-post-pandemic-world#

restoring degraded ecosystems- and moreover to achieve global climate and developments goals under the Paris Agreement and the SDGs. 27 28

If we don't get our policy responses to the COVID-19 pandemic right, we risk missing the window of opportunity that the socio-economic recovery to the COVID-19 crisis provides to both revisit our relationship with nature and build more socially and environmentally sustainable and resilient development pathways.²⁹

²⁷ Pinner, D., Rogers, M., Samandari, H. (2020). 'Addressing climate changes in a post-pandemic world: The coronavirus crisis holds profound lessons that can help us address climate change-if we make greater economic and environmental resiliency core to our planning for the recovery.' McKinsey Quaterly. April. Accessed at: https://www.mckinsey.com/business-functions/sustainability/our-insights/addressingclimate-change-in-a-post-pandemic-world# 28 FAO. 2020. The impacts of COVID-19 on the forestry sector: How to respond? Rome.

Accessed at: http://www.fao.org/3/ca8844en/CA8844EN.pdf

World Economic Forum, 2020. An enlightened response to COVID-19 can avert the climate emergency. https://www.weforum.org/agenda/2020/06/enlightened-response-covid-19-avert-climate-emergency/

Section 2. The opportunity: REDD+ is a shovel-ready forest solution, catalyst for a greener, more resilient and sustainable post-pandemic world

This section illustrates the reasons why REDD+ offers a critical and unique approach for the integration of climate, environmental and development priorities, that can contribute to a successful recovery from COVID-19 and for the avoidance of future pandemics. In doing so, this section examines the climate, development and economic reasons why REDD+ offers this unique opportunity.

2.1. Harnessing the potential of forest, other ecosystems and landscapes to accelerate global responses to the climate and COVID-19 socio-economic crisis

The COVID-19 pandemic has brought into sharp focus the inadequacy of the global response to both the biodiversity and climate emergencies. Despite committing to hold the increase in global temperature to 1.5°C, the world remains on a dangerous 3°C -or higher- degrees pathway and according to some latest-generation models, we might be exceeding towards 5°C. 30°C.

Limiting warming to 1.5°C, according to the Intergovernmental Panel on Climate Change (IPCC), requires the world to slow global emissions immediately and reach net zero CO₂ emissions by around 2050. The carbon budget estimated yearly in 2017 by the IPCC, for a two-thirds chance of staying below 1.5 °C, was about 420 Gt, equivalent to about 114 Gt of carbon. Emissions have not slowed since 2017, as of 2020, this carbon budget will be spent in approximately eight years at current emissions rates.

Transitioning to economic models that allow us to stay within this carbon budget in the long run requires not only a rapid phase-out of fossil fuels in all sectors but also the maintenance and enhancement of carbon stocks in forests, other ecosystems and landscapes. According to the IPCC 2019 special report on land, the window of opportunity when significant change can be made for limiting climate change within tolerable boundaries is rapidly narrowing. 31 Similarly, it was further emphasized that 'reducing deforestation and forest degradation rates represents one of the most effective and robust options for climate change mitigation, with large mitigation benefits globally', with a potential to provide a quarter or more of the cost-effective mitigation -about 4.1 - 6.5 GtCO₂e- by 2030. 32 33

Ecosystem and landscape restoration across the millions of degraded forests and other landscapes worldwide could provide almost 24 billion tonnes of CO2e savings per year through 2030.³⁴ Moreover, accordingly to more recent studies, avoided forest conversion offers more

³⁰ NatureResearch Journal, 2020. Short-term tests validate long-term estimates of climate change. https://www.nature.com/articles/d41586-020-01484-5

³¹ IPCC, 2019, Special Report on Climate Change, Desertification, Land Degradation, Sustainable Land Management, Food Security, and Greenhouse gas fluxes in Terrestrial Ecosystems. Chapter 1

 ³² IPCC, 2019, Special Report on Climate Change, Desertification, Land Degradation, Sustainable Land Management, Food Security, and Greenhouse gas fluxes in Terrestrial Ecosystems.
 ³³ Griscom et al. (2020) National mitigation potential from natural climate solutions in the tropics, The Royal Society. Available at:

³³ Griscom et al. (2020) National mitigation potential from natural climate solutions in the tropics, The Royal Society. Available at: https://royalsocietypublishing.org/doi/10.1098/rstb.2019.0126#d3e1835. Busch J, et al, (2019), Potential for low-cost carbon dioxide removal through tropical reforestation. *Nat. Clim. Change* **9**, 463

³⁴ Griscom et al., 2017. Natural climate solutions.

than twice as much of the cost-effective climate mitigation potential than forest restoration,³⁵ with tropical regions offering the greater opportunities for avoiding deforestation (Figure 1), while resulting in a diversity of biodiversity and ecosystem service benefits. This in turn speaks to high recent tropical forest loss rates,³⁶ and relatively low economic costs of avoiding such losses.³⁷ Furthermore, avoiding catastrophic climate change requires improved ecosystem stewardship. Recent analysis demonstrates that a range of ecosystems are vulnerable to the release of 'irrecoverable carbon' upon land use conversion, which could result in unavoidable and catastrophic climate impacts (see Figure 1)³⁸. Ecosystems with high amounts of irrecoverable carbon represent unambiguous targets for a range of urgent policy and investment decisions to prevent any future emissions from these ecosystems.

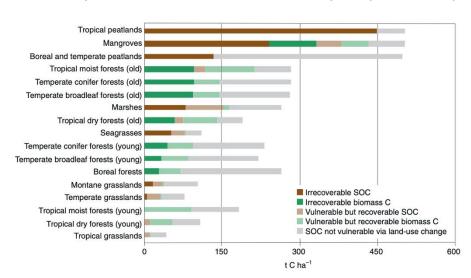


Figure 1: Estimated amount of carbon that is recoverable or irrecoverable in major ecosystems within 30 years

Source: Goldstein et al (2020). Colours distinguish carbon in soil (brown) and biomass (green) pools. Irrecoverable carbon (indicated by dark brown and green shading) is shown separately from carbon that is either not vulnerable (light grey shading) or is vulnerable but recoverable (light brown and light green shading).

2.2. Forest solutions as an integral part of the COVID-19 recovery process

Partly as a result from the on-going pandemic, there is an increased awareness -in both citizens and decision makers, at national and international levels- of the impact that deforestation and the degradation of forests, other ecosystems and landscapes have in increasing the likelihood of spillover of zoonotic diseases,³⁹ 40 and how human and

³⁵ Griscom et al. (2020) National mitigation potential from natural climate solutions in the tropics, The Royal Society. Available at: https://royalsocietypublishing.org/doi/10.1098/rstb.2019.0126#d3e1835

³⁶ Hansen MCet al. 2013High-resolution global maps of 21st-century forest cover change. Science 342, 850-853

³⁷ Busch J, et al. (2019), Potential for low-cost carbon dioxide removal through tropical reforestation. *Nat. Clim. Change* **9**, 463

³⁸ Goldstein et al (2020), Protecting irrecoverable carbon in Earth's ecosystems, *Nat. Clim. Change*

³⁹ Wilkinson DA, Marshall JC, French NP, Hayman DTS. 2018Habitat fragmentation, biodiversity loss and the risk of novel infectious disease emergence. *J. R. Soc. Interface* 15, 20180403

⁴⁰ Hahn MB, Gurley ES, Epstein JH, Islam MS, Patz JA, Daszak P, Luby SP. 2014The role of landscape composition and configuration on *Pteropus giganteus* roosting ecology and Nipah virus spillover risk in Bangladesh. *Am. J. Trop. Med. Hyg.* 90, 247-255. Rulli MC, Santini M, Hayman DTS, D'Odorico P. 2017The nexus between forest fragmentation in Africa and Ebola virus disease outbreaks. *Sci. Rep.* 7, 41613.

nature's health as intrinsically connected.⁴¹ Such awareness, in turn provides a window of opportunity for increased political support to COVID-19 recovery responses that maximize environmental, social and economic benefits in rural landscapes.⁴²

This collective awareness has in turn drawn attention towards nature-based solutions, as holistic ecosystem-based 'actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits.'⁴³ Ecosystem-based approaches for both climate change or sustainable resource management have been applied since the 1980s, underpinning for instance voluntary carbon markets. Similarly, for over 10 years, Parties under the UNFCCC established a comprehensive methodological framework to realise the mitigation potential of forest solutions through reducing emissions from deforestation and forest degradation, the role of conservation, sustainable management of forests and enhancing forest carbon stocks -commonly referred to as REDD+.

As an umbrella concept, nature-based solutions (NBS) has gained popularity in recent years,⁴⁴ seen not only as a way to reconcile economic development with the stewardship of ecosystems, but also as a means for better growing, to diversify and transform business and enable sustainable development.⁴⁶ While encompassing a spectrum of interventions -from protecting or restoring ecosystems towards establishing managed or hybrid approaches, to supporting biodiversity conservation to enhance ecosystem resilience, or being led by local communities-⁴⁷ NBS have recently gained prominence in the context of climate mitigation given the significant potential to increase carbon storage and/or avoid greenhouse gas emissions across global forests, other ecosystems and agricultural lands through conservation, restoration, and improved land management,⁴⁸ as aforementioned.

Together with the world's food and commodity production systems, forest solutions play a key role in simultaneously achieving climate, biodiversity, health and sustainable development global objectives⁴⁹ and thus are instrumental in building a better, greener, more resilient and sustainable world.

2.3. The opportunity to leverage the right scale of financing to harness forest solutions in support of COVID-19 recovery responses

⁴¹ UNEP. 2020. 'Working with nature to protect people: UNEP's COVID-19 Response.' Accessed at: https://www.unenvironment.org/resources/working-environment-protect-people-uneps-covid-19-response

⁴² Pinner, D., Rogers, M., Samandari, H. (2020). 'Addressing climate changes in a post-pandemic world: The coronavirus crisis holds profound lessons that can help us address climate change-if we make greater economic and environmental resiliency core to our planning for the recovery.' McKinsey Quaterly. April. Accessed at: https://www.mckinsey.com/business-functions/sustainability/our-insights/addressing-climate-change-in-a-post-pandemic-world#

⁴³ E. Cohen-Shacham, et al, 2016, Nature-Based Solutions to Address Societal Challenges. Gland, Switzerland: International Union for Conservation of Nature

⁴⁴ Seddon N, Chausson A, Berry P, Girardin CAJ, Smith A, Turner B. 2020 Understanding the value and limits of nature-based solutions to climate change and other global challenges. Phil. Trans. R. Soc. B 375: 20190120. http://dx.doi.org/10.1098/rstb.2019.0120

⁴⁵ Ecosystem Marketplace, 2019. Financing Emissions Reductions for the Future: State of Voluntary Carbon Markets 2019. December. https://app.hubspot.com/documents/3298623/view/63001900?accessId=eb4b1a

⁴⁶ The Food and Land Use Coalition, 2019. Growing Better: Ten critical transitions to transform food and land use. September. https://www.foodandlandusecoalition.org/wp-content/uploads/2019/09/FOLU-GrowingBetter-GlobalReport-ExecutiveSummary.pdf

⁴⁷ Seddon N, Chausson A, Berry P, Girardin CAJ, Smith A, Turner B. 2020 Understanding the value and limits of nature-based solutions to climate change and other global challenges. Phil. Trans. R. Soc. B 375: 20190120. http://dx.doi.org/10.1098/rstb.2019.0120

⁴⁸ Bronson, W. 2017, Natural climate solutions, Proceedings of the US National Academy of Sciences (PNAS)

⁴⁹ The Food and Land Use Coalition, 2019. Growing Better: Ten critical transitions to transform food and land use. September. https://www.foodandlandusecoalition.org/wp-content/uploads/2019/09/FOLU-GrowingBetter-GlobalReport-ExecutiveSummary.pdf

The World Economic Forum's 2020 Global Risks Report ranks biodiversity loss and ecosystem collapse as one of the top five risks in terms of likelihood and impact in the coming 10 years. It highlights how forests and other ecosystems are material to businesses in all industry sectors, noting that \$44 trillion of economic value generation – more than half of the world's total GDP – is moderately or highly dependent on nature and its services.

Industries that are highly dependent on nature generate 15% of global GDP (\$13 trillion), while moderately dependent industries generate 37% (\$31 trillion). Together, the three largest sectors that are highly dependent on nature generate close to \$8 trillion of gross value added (GVA). As nature loses its capacity to provide such services, these sectors could suffer significant losses. For example, 60% of coffee varieties are in danger of extinction due to climate change, disease and deforestation. If this were to happen, global coffee markets – a sector with retail sales of \$83 billion in 2017⁵² – would be significantly destabilized, affecting the livelihoods of many smallholder farmers.

Dependency on nature can vary considerably between different industries and sectors. While the risk to primary industries is straightforward to grasp, the consequences for secondary and tertiary industries can also be significant. For example, six industries – chemicals and materials; aviation, travel and tourism; real estate; mining and metals; supply chain and transport; retail, consumer goods and lifestyle – with less than 15% of their direct GVA highly dependent on nature still have 'hidden dependencies' through their supply chains.⁵³ More than 50% of the GVA of their supply chains is highly or moderately dependent on nature. Figure 2 illustrates in more detail the proportion of GVA exposed to nature loss in 22 global industries.

Figure 1: Percentage of direct and supply chain GVA with high, medium and low nature dependency, by industry

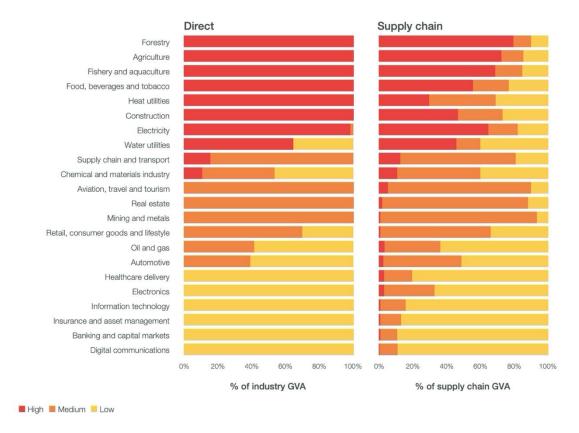
⁻

⁵⁰ These are construction (\$4 trillion), agriculture (\$2.5 trillion) and food and beverages43 (\$1.4 trillion).

⁵¹ A.P. Davis et al., 2019, "High extinction risk for wild coffee species and implications for coffee sector sustainability", Science Advances, https://advances.sciencemag.org/content/5/1/eaav3473 (link as of 16th Dec 2019).

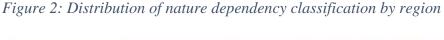
⁵² Euromonitor International, 2018, "Five most promising markets in coffee", http://go.euromonitor. com/rs/805-KOK-719/images/Five_Most_Promising_Markets_in_Coffee.pdf?mkt_ tok=eyJpIjoiT1RrME56TTFNalUxWmpoaSIsIn (link as of 16th Dec 2019).

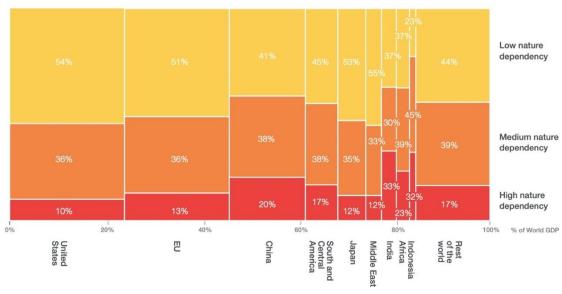
⁵³ World Economic Forum, 2020, Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy. Available at http://www3.weforum.org/docs/WEF_New_Nature_Economy_Report_2020.pdf



Source: PWC for World Economic Forum, 2020, Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy

In terms of global exposure, large economies have the highest absolute amounts of GDP in nature-dependent sectors: \$2.7 trillion in China, \$2.4 trillion in the EU, and \$2.1 trillion in the United States. As Figure 3 illustrate these regions with relatively lower shares of their economies at high exposure to nature loss hold a substantial share of the global exposure and hence must urgently help address these risks.





Source: PWC for World Economic Forum, 2020, Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy

The forest and land use sector underpin and regulate the climate on which the global economy relies.⁵⁴ Transitioning to sustainable food and land use-business models could be worth up to US\$2.3 trillion and provide over 70 million jobs by 2030.⁵⁵ Forest industries contribute an estimated US\$450 billion to annual national incomes globally⁵⁶ and over US\$250 billion per year to developing country economies.⁵⁷ Avoiding further deforestation alone could boost the global economy by at least US\$40—80 billion per year.⁵⁸

However, current trends on climate finance are alarming. Despite the mitigation potential of forests, other ecosystems and the land use sector as a whole by 2030, since 2010⁵⁹ only US\$3.2 billion of global climate finance is estimated to have been invested in climate action in the sector compared to the US\$256 billion committed in multilateral and public funding to climate change mitigation.^{60 61} Overall investments in 'natural' infrastructure—forests, wetlands, peatlands, mangroves, and other critical ecosystems—is grossly marginal and overlooked despite is critical role in tackling the climate crisis and in achieving biodiversity conservation and development objectives.

2.4. REDD+ is a shovel-ready climate forest solution

Over the past decade over 65 countries in the development of a diverse array of policy and implementation instruments as well as technical structures to support subnational or national REDD+ actions. Having been conceived as a mitigation-based forest solution, significant progress has been made in strengthening forest monitoring systems as well as structures and procedures for robust accounting of real, credible and environmentally integral emissions reductions from REDD+ implementation, as the monitoring and evaluation framework in place to assess REDD+ performance. Similarly, about fifteen pioneer countries have completed and officially enacted national or subnational REDD+ strategies, action plans or other policy instruments to foster the potential of forest solutions, by tackling underlying and direct drivers of forests and ecosystems loss and degradation. Many others are still undertaking preparation efforts to effectively implement REDD+ actions, playing a critical role in the sustainable transition of food and land use systems towards productive, greener and more resilient rural economies, while valuing and protecting ecosystems and natural resources. ⁶²

⁵⁴ CIFOR, n.d. Forests and Climate Change. CIFOR, Bogor, Indonesia. Available at: https://www.cifor.org/forests-andclimate-change/.

⁵⁵ Business and Sustainable Development Commission, 2016. Better Business, Better World. BSDC, London. Available at: http://report.businesscommission.org/.

⁵⁶ UN, 2013. Economic Contribution of Forests. Background paper. United Nations, Geneva. Available at: http://www.un.org/esa/forests/pdf/session documents/unff10/ EcoContrForests.pdf.

⁵⁷ UN, 2013. Economic Contribution of Forests.

⁵⁸ GCEC, 2015. Seizing the Global Opportunity; The Economics of Ecosystems and Biodiversity (TEEB), 2010. Kumar, P. (ed.), The Economics of Ecosystems and Biodiversity Ecological and Economic Foundations; Costanza et al., 2014. Changes in the global value of ecosystem services. Global Environmental Change, 26, 152—158. DOI: 10.1016/j. gloenvcha.2014.04.002; UNEP, 2014. Building Natural Capital: How REDD+ Can Support a Green Economy. Report of the International Resource Panel. UNEP, Nairobi. Available at: http://www.unep.org/resourcepanel/Publications/ BuildingNaturalCapitalHowREDD/tabid/132320/ Default.aspx; These estimates have also been critiqued as oversimplifying in the context of spatial variability and nonlinearities in benefits. For a recent assessment of the value of forests, see, for example, Mullan, K., 2014. The Value of Forest Ecosystem Services to Developing Economies. CGD Climate and Forest Center for Global Development, Washington, DC. Available http://www. $cgdev.org/sites/default/files/CGD_Climate_Forest_6_Value_Forest_Ecosystems-Mullan.pdf.$

⁵⁹ IPCC, Mitigation Pathways Compatible with 1.5°C in the Context of Sustainable Development

⁶⁰ OECD, 2016. OECD Agricultural Policy Monitoring and Evaluation 2016: Highlights and Recommendations. Available at: https://www.oecd.org/tad/agricultural-policies/agriculture-policy-monitoring-flyer-2016.pdf.

⁶¹ NYDF Assessment Partners. (2019). Protecting and Restoring Forests: A Story of Large Commitments yet Limited Progress. New York Declaration on Forests Five-Year Assessment Report. Climate Focus (coordinator and editor). Accessible at forestdeclaration.org.

⁶² The Food and Land Use Coalition, 2019. Growing Better: Ten critical transitions to transform food and land use. September. https://www.foodandlandusecoalition.org/wp-content/uploads/2019/09/FOLU-GrowingBetter-GlobalReport-ExecutiveSummary.pdf

The human rights and do-good approach underpinning the design and implementation of REDD+ actions has proven to be critical in making of REDD+ a win-win forest solution. On the one hand, the highly participatory and inclusive policy design processes have allowed to consider the trade-offs between policy options to be implemented to improve rural livelihoods and foster greener, more resilient, sustainable and productive forests and rural landscapes. On the other hand, the robust understanding of the social and environmental dimensions of REDD+, including the synergies with sustainable development objectives and international commitments for instance under the Aichi Targets, have allowed to design robust REDD+ interventions that integrate for instance spatial analysis to inform on the nature, scale and importance of the social and environmental co-benefits from REDD+. As such, well-designed national or subnational REDD+ policies and measures constitute available and operational policy instruments to the COVID-19 recovery that not only can enhance social and ecosystem resilience, but significantly reduce the risk to future zoonic pandemics.

REDD+, through national strategies and its supporting policy, institutional, monitoring and financial structures already in place -or under development- provide a unique opportunity to accelerate the socio-economic recovery to the COVID-19 pandemic in rural forest landscapes across tropical forest countries. With domestic public and private resources, countries as Colombia and Costa Rica have already being deploying market-based incentives to reduce forest loss and degradation through leveraging revenues from taxes on fossil fuels to invest in forest solutions – including conservation, restoration and improved land management to protect biodiversity and ecosystem services. If similar market-based incentives were deployed in other 12 megadiverse countries, approximately \$1.8 billion could be raised each year between them to be reinvested in forest solutions. 63

The implementation of said forest solutions will contribute to further climate change mitigation outcomes that can in turn leverage REDD+ results-based financing. By October 2020, four countries have signed their Emission Reductions Purchase Agreements under the FCPF's Carbon Fund to access to results-based payments for emissions reductions achieved, while 14 country Programs have advanced to ER Payment Agreement⁶⁴. As of November 2020, eight countries have their Funding Proposals approved under the GCF's REDD+ results-based Pilot Programme, for US\$496.8 million in results-based payments.⁶⁵ While it is still early to fully capture the extent to which REDD+ policies, measures and structures in place will support the delivery of COVID-19 recovery responses in forest countries, several countries are integrating payment for ecosystem service and social forestry models into their national REDD+ strategies and action plans, as beneficiaries of REDD+ results-based payments. These models show how countries' REDD+ efforts can contribute to Covid-19 socio-economic recovery - delivering a 'triple-win' for health, climate, and economic wellbeing - and the potential to create a 'virtuous circle' of forest emissions reductions and corresponding results-based payments yielding intensified conservation efforts and livelihood benefits.

Costa Rica's payment for environmental services program, first established in 1995, is a system of voluntary contracts through which a well-defined land-use practice likely to secure an environmental service is paid for if, and only if, the participants conduct the agreed sustainable

⁶³ Barbier, E.B. 2020. 'A green post-COVID-19 recovery.' In United Nations Association-UK (UNA-UK). Climate 2020: The path ahead. Witan Media, Painswick, UK, pp/54-56. https://www.climate2020.org.uk/wp-content/uploads/2020/04/054-056-C2020-Barbier.pdf

⁶⁴ See FCPF 2020 Annual Report published in October 2020: https://www.forestcarbonpartnership.org/document/fcpf-2020-annual-report

 $^{^{65}}$ With Chile have a results-based payments agreement under both.

land-use practice. The program prioritises benefits to women and indigenous peoples. Over the last 5 years the PES program has been fully funded by the national carbon-tax and water fee but, in the current economic downturn, the recent results-based payment from the Green Climate Fund for the country's REDD+ efforts is essential to sustaining the transfer of needed cash resources directly to impoverished groups to support their forest conservation efforts and livelihoods in the COVID-19 recovery phase.

Ecuador's Socio-Bosque program and Brazil's Floresta+ program follow similar payment for ecosystem service models that, together with Costa Rica's pioneering approach, provide a blueprint for publicly and privately-funded national cash-transfer programs that can serve as an essential tool for governments to protect and restore forests, thus providing protection from future pandemics, while also alleviating poverty and improving livelihoods, contributing to inclusive and equitable Covid-19 recovery.

Indonesia is implementing a social forestry program funded in part by results-based payments for REDD+. The program aims to alleviate poverty, halt deforestation, and end forestland conflicts by giving local communities the opportunity to manage forests themselves – and to develop sustainable livelihoods based in and around them. Because more than 74 per cent of Indonesia's poor depend on ecosystem services for their livelihoods, depletion of these services would have drastic impacts on the livelihoods of the poor while simultaneously widening the inequality gap. Indonesia's social forestry program is an example of how investment in locally-driven forest conservation and management can yield benefits for the climate and livelihoods, while also providing social protection against shocks like that of the Covid-19 pandemic.

The Community-based REDD+ Initiative (CBR+), delivered in partnership by UN-REDD and the GEF Small Grants Programme, is another model that has demonstrated results delivering funding and technical support directly from global donors to forest communities, backstopped with UN quality assurance and existing country mechanisms and capacity. The CBR+ model presents the opportunity to turn global COVID19 response funds into community grants at the grassroots level with three integrated impacts: 1) livelihood support, which is key for rural communities in forested landscapes, as communities grapple with economic impacts of COVID-19; 2) support forests and prevent deforestation, as reverse urban-rural migration driven by the COVID-19 pandemic increases pressure on forested landscapes through subsistence agriculture and fuel wood collection; 3) empower communities to undertake culturally appropriate and landscape specific responses to address both the risks and the impacts of this virus.

The hundreds of millions of degraded ecosystems and undermanaged landscapes worldwide coupled with the hundreds of hectares pledged to ecosystem restoration under a diversity of international and regional initiatives-⁶⁶ ⁶⁷ ⁶⁸ offer large opportunities to enhance rural livelihoods and economies, including job generation. Ecosystem and landscape restoration, including through ecosystem restoration, regeneration or more sustainable agricultural practices, ⁶⁹ can make a lasting contribution to adaptation, resilience and decreasing migration: the worsening impacts of climate change could force over 140 million people to move within

⁶⁶ Bonn Challenge. The Challenge: A Global Effort. Available at: http://www.bonnchallenge.org/content/challenge.

⁶⁷ 4 per 1000, 2015. Welcome to the 4 per 1000 Initiative. Available at: https://www.4p1000.org/.

⁶⁸ UNEP and FAO, 2020. Strategy of the United Nations Decade on Ecosystem Restoration. Draft for comments. February. http://wedocs.unep.org/xmlui/bitstream/handle/20.500.11822/31813/ERDStrat.pdf?sequence=1&isAllowed=y

⁶⁹ UNEP and FAO, 2020. Strategy of the United Nations Decade on Ecosystem Restoration. Draft for comments. February. http://wedocs.unep.org/xmlui/bitstream/handle/20.500.11822/31813/ERDStrat.pdf?sequence=1&isAllowed=y

their countries, due to a series of growing problems that could be addressed by restoring degraded lands into productive and healthy ecosystems. ⁷⁰ Moreover, large scale restoration can further contribute not only to increase climate mitigation efforts and enhance ecosystem resilience but could provide an estimated US\$84 billion in annual economic benefits worldwide. ⁷¹

For the reasons examined above- REDD+ constitutes the shovel-ready climate forest solution -the most robust, comprehensive, proven and operational- which offers a unique opportunity to deploy COVID-19 socio-economic recovery efforts at the pace and scale required in rural forest landscapes, while reducing the risk to future zoonic pandemics.

Progress on climate change will depend significantly on the extent to which COVID-19 recovery policy choices are consistent with a long-term downward trend in GHG emission. The socio-economic recovery to the pandemic represents a crucial 'reset moment for humanity', when governments and the private sector worldwide are 'rewriting the textbooks on politics and the economy [...].' The extent to which global efforts in averting the climate emergency succeed or fail, will depend on how we build better our economies today.⁷²

However, despite the scale of the role that forest and land use sector must play in delivering emission reductions by 2030, 73 since 2010, less than US\$1.2 billion per year of global climate finance is estimated to have been invested to limit GHG emissions from deforestation and land use—a striking mismatch. Correcting this mismatch is essential to the 'reset moment for humanity' mentioned above.

2.5. COVID-19 socio-economic recovery responses represent a use-it-or-lose-it window of opportunity to a build greener, more resilient and sustainable world consistent with the Paris Agreement

According to the IMF, to date, almost all countries are enacting some kind of recovery stimulus package (e.g. grants, loans, incentives). Such recovery packages will largely differ between major, middle to low income economies as well as depending on the depth of the socioeconomic crisis and their particular needs to recover from the socio-economic impact of the pandemic. There a risk however, that financial recovery packages ultimately prioritize investments in business-as-usual practices that exacerbate environmental externalities, recovery including increased greenhouse gases emissions and pressure on nature.

Many G20 national governments have already proposed and/or implemented sizeable fiscal rescue measures and by April 2020, all G20 nations (including most EU member states), signed

18

⁷⁰ World Bank, 2018. Groundswell: Preparing for Internal Climate Migration.

⁷¹ Wu, A., 2017. How Can Restoring Degraded Landscapes Deliver Financial Returns?

⁷² World Economic Forum, 2020. An enlightened response to COVID-19 can avert the climate emergency. https://www.weforum.org/agenda/2020/06/enlightened-response-covid-19-avert-climate-emergency/.

⁷³ IPCC, Mitigation Pathways Compatible with 1.5°C in the Context of Sustainable Development

⁷⁴ OECD, 2016. OECD Agricultural Policy Monitoring and Evaluation 2016: Highlights and Recommendations. Available at: https://www.oecd.org/tad/agricultural-policies/agriculture-policy-monitoring-flyer-2016.pdf.

⁷⁵ Barbier, E.B. 2020. 'A green post-COVID-19 recovery.' In United Nations Association-UK (UNA-UK). Climate 2020: The path ahead. Witan Media, Painswick, UK, pp/54-56. https://www.climate2020.org.uk/wp-content/uploads/2020/04/054-056-C2020-Barbier.pdf

⁷⁶ Pinner, D., Rogers, M., Samandari, H. (2020). 'Addressing climate changes in a post-pandemic world: The coronavirus crisis holds profound lessons that can help us address climate change-if we make greater economic and environmental resiliency core to our planning for the recovery.' McKinsey Quaterly. April. Accessed at: https://www.mckinsey.com/business-functions/sustainability/our-insights/addressing-climate-change-in-a-post-pandemic-world#

⁷⁷ UN. April 2020. A UN Framework for the immediate socio-economic response to COVID-19.

said fiscal measures into law, earmarking a total of over US\$7.3 trillion in spending. The priority of the rescue packages has naturally been to increase cash flows to individuals in financial distress as well as support addressing needs for food, shelter, health, and other basic needs. The imminent recovery packages, soon to be designed and implemented, will reshape the economy for the longer-term. This in turn entails critical implications for the well-being of future generations, including regarding the implications of the COVID-19 socio-economic recovery in the extent to which ambitious global efforts continue to be deployed to address the climate crisis.

Within the G20, the European Commission is specifically calling for a green recovery, putting biodiversity and climate change front and centre of its recovery efforts. The European Commission has insisted that the European Green Deal – the centrepiece for delivering SDGs in and by the EU – will be an integral part of the EU recovery plan, including 50-55% GHG reduction from 1990s levels and structural reforms within the energy and transport sectors. On 27 May, the Commission unveiled a recovery package containing a reinforced long-term EU budget for 2021-2027, as well as the new Recovery Instrument, 'Next Generation EU'. The funds will be used to reach the EU's objectives of climate neutrality and digital transformation. The EU has set the objective to become carbon neutral by 2050.

Canada, with its G20 partners Italy and Brazil, has also stepped forward in support of the UN system on food security, calling for a global and long-term response, also stating that 'strengthening the fundamental nexus between humanitarian assistance and sustainable development will also be crucial'.⁸¹ However, we are yet to see how these countries respectively commit to policies that enunciate this statement. The Netherlands highlighted that emergency response and recovery packages must be aligned with the SDGs and the Paris Agreement on climate change, noting that the focus needs to remain on vulnerable people and a sustainable future – leaving no one behind.⁸²

Both the World Bank and the IMF, as well as other international funding organisations, have also stepped forward with explicit support to the green recovery. The World Bank's approach refers to a 'green stimulus framework', urging for the need to avoid starting from scratch and capitalize on already prioritized projects in countries' national or sectoral masterplans. The IMF has called for utilising all available levers to enable a green recovery, including using public funding to promote green private finance and secure long-term commitments to low-carbon alternatives⁸³. In a similar vein, the European Bank for Reconstruction and Development (EBRD) has stated that counteracting the pandemic creates an opportunity to 'tilt to green' the large-scale recovery spending being pledged, making this a key accelerator towards a low-carbon economy.⁸⁴

Nevertheless, while the pursue toward a green recovery is at the core of global conversations towards building greener, more resilient and sustainable development and

⁷⁸ https://www.climatechangenews.com/2020/04/09/european-green-deal-must-central-resilient-recovery-covid-19/

⁷⁹ https://www.euractiv.com/section/energy-environment/news/green-deal-will-be-our-motor-for-the-recovery-von-der-leyen-says/

⁸⁰ EU Parliament. P9_TA(2020)0124. European Parliament resolution of 15 May 2020 on the new multiannual financial framework, own resources and the recovery plan (2020/2631(RSP))

⁸¹ https://www.canada.ca/en/global-affairs/news/2020/04/joint-statement-by-brazil-canada-italy-and-egypt-following-the-extraordinary-high-level-meeting-of-the-group-of-friends-of-food-security-and-nutrit.html

⁸² https://www.un.org/sites/un2.un.org/files/netherlands_video_message_pm_rutte.pdf

⁸³ https://climatepolicyinitiative.org/event/petersberg-climate-dialogue-financing-climate-ambition-in-the-context-of-covid-19/

⁸⁴ https://www.ebrd.com/news/2020/spending-to-counteract-coronavirus-creates-chance-to-tilt-to-green-.html

economic pathways, a recent analysis has identified that only 4% of those announced COVID-19 recovery financial policies from G20 countries are in fact 'green', with real potential to reduce long-run GHG emissions. 85 The vast majority, 92%, are seen as 'neutral' and thus would maintain the status quo, and 4% of said policies are identified as 'brown', and likely to increase net GHG emissions beyond the base case. The analysis further explored the extent to which climate and other sustainable development objectives could -or should- be considered by policymakers in a more prominent way in said COVID-19 financial and policy recovery responses. Said analysis thus underscored that investments in natural capital for ecosystem resilience and regeneration, including restoration of carbon-rich habitats and climate friendly agriculture- are one (out of the five) fast-acting policies that can both achieve simultaneously economic and climate goals, yet the speed with which long-term recovery packages are delivered will be critical to achieve their expected impact.

The WB's green stimulus framework goes in those lines, referring to climate change adaptation plans and the NDCs under the Paris Agreement as some of strategic national or subnational projects already prioritized for multilateral support. Forest and land use projects that restore degraded forestlands and landscapes are amongst those, as they entail a significant potential to create jobs over the short term while also generating net benefits worth hundreds of billions of dollars from watershed protection, better crop yields, and forest products.'86 Similarly, NDC Invest⁸⁷, a platform created by the Inter-American Development Bank, is considering ways it can best help nations during the pandemic, and how to deliver assistance to support an economic recovery consistent with a just transition and the Paris Agreement's goals.

As examined above, national and subnational REDD+ strategies or action plans developed to date broadly provide the implementation means to deploy forest solutions in the context of recovery packages in a way that not only contribute to tackling the climate crisis but also increases resilience of rural societies and economies in forest tropical countries while contributing reduce the risk of future pandemics.⁸⁸ Yet, as underscored by both KIIs and literature reviewed in producing this paper, pressing economic needs are putting at risk the progress and ambitious public and private efforts to halt forests and ecosystems loss and degradation. Environmental governmental agencies and citizens in forest countries are struggling to integrate climate, environmental and rural development priorities into said **recovery packages.** This in turn, would constraint long-term and urgent objectives to achieve international development and environmental priorities as under the SDGs, the Paris Agreement or the UN Decade on Ecosystem Restoration, ⁸⁹ 90 especially when considering that most forest and land-based mitigation objectives under countries current -and under revision-NDCs to date are conditional to international support.

⁸⁵ Hepburn, C., O'Callaghan, B., Stern, N., Stiglitz, J., and Zenghelis, D. (2020), 'Will COVID-19 fiscal recovery packages accelerate or retard progress on climate change?', Smith School Working Paper 20-02. Page 4.

86 World Bank Steinbarg Hellinger 11.

⁶ World Bank, Stéphane Hallegatte and Stephen Hammer. Thinking ahead: For a sustainable recovery from COVID-19. March 2020. https://blogs.worldbank.org/climatechange/thinking-ahead-sustainable-recovery-covid-19-coronavirus?cid=SHR BlogSiteShare EN EXT ⁸⁷ The Inter-American Development Bank (IDB) and the Inter-American Investment Corporation (IIC) – together, the IDB Group announced the creation of NDC Invest, a one-stop shop to help countries access resources needed to translate national climate commitments into investment plans and bankable projects.

⁸⁸ Pinner, D., Rogers, M., Samandari, H. (2020). 'Addressing climate changes in a post-pandemic world: The coronavirus crisis holds profound lessons that can help us address climate change-if we make greater economic and environmental resiliency core to our planning for the recovery.' McKinsey Quaterly. April. Accessed at: https://www.mckinsey.com/business-functions/sustainability/our-insights/addressingclimate-change-in-a-post-pandemic-world#

⁸⁹ Pinner, D., Rogers, M., Samandari, H. (2020). 'Addressing climate changes in a post-pandemic world: The coronavirus crisis holds profound lessons that can help us address climate change-if we make greater economic and environmental resiliency core to our planning for the recovery.' McKinsey Quaterly. April. Accessed at: https://www.mckinsey.com/business-functions/sustainability/our-insights/addressingclimate-change-in-a-post-pandemic-world#

⁹⁰ FAO. 2020. The impacts of COVID-19 on the forestry sector: How to respond? Rome. Accessed at: http://www.fao.org/3/ca8844en/CA8844EN.pdf

Global financial stimulus to recover from the socio-economic impact of the COVID-19 represent a window of opportunity to foster a *'green structural transformation of the world economy'*⁹¹ when building a back better, more resilient and sustainable world, with environmental, social and economic resilience at the core of the recovery processes. Forest solutions through REDD+ policies and/or investment plans provide an opportunity to achieve the paradigm shift that ensures long-term stimulus that *accelerates rather than undermine decarbonization*, while promoting economic, social and environmental sustainability, *gender and social equity and inclusion*. ^{92 93 94 95}

-

⁹¹ Barbier, E.B. 2020. 'A green post-COVID-19 recovery.' In United Nations Association-UK (UNA-UK). Climate 2020: The path ahead. Witan Media, Painswick, UK, pp/54-56. https://www.climate2020.org.uk/wp-content/uploads/2020/04/054-056-C2020-Barbier.pdf

⁹² Pinner, D., Rogers, M., Samandari, H. (2020). 'Addressing climate changes in a post-pandemic world: The coronavirus crisis holds profound lessons that can help us address climate change-if we make greater economic and environmental resiliency core to our planning for the recovery.' McKinsey Quaterly. April. Accessed at: https://www.mckinsey.com/business-functions/sustainability/our-insights/addressing-climate-change-in-a-post-pandemic-world#

⁹³ Mendulice, M. (2020). 'How to build back better after COVID-19'. World Economic Forum. Accessed at: https://www.weforum.org/agenda/2020/04/how-to-build-back-better-after-covid-19/

⁹⁴ Kumar, P. (2020). 'Centre stage for Nature in post-pandemic economic recovery process', The Indian Express. June. Accessed at: https://indianexpress.com/article/opinion/web-edits/centre-stage-for-nature-in-post-pandemic-economic-recovery-process-6448794/

⁹⁵ United Nations Sustainable Development Group. April 2020. 'A UN Framework for the immediate socio-economic response to COVID-19'. Accessed at: https://unsdg.un.org/sites/default/files/2020-04/UN-framework-for-the-immediate-socio-economic-response-to-COVID-19.pdf

Section 3. UN-REDD's strategic priorities for building a better, greener, more resilient post-pandemic world

As examined in previous sections, it is critical that COVID-19 recovery plans prioritize and invest in REDD+ implementation at scale, as it can foster long-term social and environmental resilience while ensuring social equity, inclusion and the realization of human's rights through the protection, restoration and sustainable use and management of forest ecosystems, while directly addressing some of the root causes from zoonic pandemics. In this context, this section explores the strategic opportunities and priorities to capitalise on -and accelerate-REDD+ implementation at scale to accelerate the deployment of COVID-19 recovery efforts in forest tropical countries. In doing so, this section broadly draws upon evidence examined and KIIs, as well as builds on the 2018-2020 Technical Assistance for REDD+ Implementation Framework, and the forthcoming 2021 Workplan and Budget for UN-REDD Technical Assistance and the 2021-2025 Results Framework in an effort to align the findings identified to UN-REDD's planning and operating instruments.

3.1. Harnessing the realization of forest solutions while fostering greener, more resilient and sustainable rural livelihoods

As examined in previous sections, REDD+ is the most robust, comprehensive, proven and operational -shovel-ready- climate forest solution and is thus critical that COVID-19 recovery packages prioritize and invest in REDD+ implementation at scale. In doing so, not only will it be enabling the structural transformations required in rural economies and catalyse integrated, greener, more resilient, sustainable and productive landscapes consistency with 1.5C pathways; it will also be contributing to address the environmental root causes of zoonotic diseases and thus, reducing the risk to future pandemics.

The UN-REDD Programme holds a unique global expertise and innovative approach to support country actions that generate forest-based GHG emission reductions and carbon removals, of increasing quality and that are socially and environmentally sound. As part of the design of comprehensive policy interventions to deploy forest solutions through REDD+ strategies and instruments, UN-REDD has supported the identification and/or establishment of policy, institutional, governance and financial arrangements setting the foundations for immediate on-the-ground implementation and structural transformations to improve rural livelihoods and enhance the resilience of rural societies, economies and landscapes. In doing so, recent data underscores the UN-REDD has directly supported to date over thirty four (34) countries in the preparation of fully developed national REDD+ strategies or action plans (NS/APs), thirty (30) have been finalized, twenty four (24) have been enacted by their national governments, and fifteen (15) have been submitted to the UNFCCC.

Furthermore, UN-REDD has supported the definition of country-tailored investment plans and programmes to implement priority policies and measures, while maximizing the delivery of social and environmental benefits. The integration of social, environmental and governance principles through UN-REDD's innovative approach to Cancun Safeguards, is perceived

⁹⁶ GEF, The GEF Small Grants Programme, UNDP. April (2020). Guidance on COVID-19 Response, recovery, and adaptive management. Draft.

by KIIs as essential and urgent for lasting and transformative REDD+ implementation, as it increases the cost-efficiency of REDD+ investments allowing not only to pursue climate change mitigation objectives but rather achieve broader socio-economic COVID-19 recovery objectives through more holistic recovery responses.

Yet, actual implementation of said investment plans and programmes remains both a challenge and priority, according to most KIIs. Given the diversity of national and subnational REDD+ interventions, and the diverse stages of development of said interventions, UN-REDD's unique and tailored technical assistance is deemed as critical to continue to support target countries in having in place the policy, institutional, financing and monitoring structures that will enable the realization of forest solutions through REDD+ results-based implementation, towards contributing to the socio-economic recovery of rural economies and livelihoods, ⁹⁷ the following opportunities and priorities have been identified:

- Definition and implementation of investment plans and programmes to implement policy and on-the-ground actions towards diversified, integrated and sustainable rural livelihoods. Underpinned by a landscape approach, the vast majority of forest tropical countries have identified a diverse array of REDD+ actions to contribute towards diversified, integrated and sustainable rural livelihoods, including measures to support to micro, small and medium enterprises for deforestation-free food and commodity production. This in turn not only generate jobs and incomes but also contribute to enhanced food security, and therefore enhance social resilience to economic shocks as the one resulting from the on-going pandemic. Implementation of said actions in a way that realizes the mitigation potential of forest solutions requires the identification and design of tailored REDD+ policies and measures, and their respective investment plans and programmes, which are activities under UN-REDD's technical assistance that gain relevance as suggested by KIIs.
- Definition and implementation of investment plans and programmes to implement policy and on-the-ground actions towards integrated and sustainable landscape approaches, including increased forest protection and restoration that build ecosystem and social resilience. As in the point examined above, REDD+ policy instruments defined with a landscape approach have broadly resulted in the identification of priority REDD+ actions that promote integrated and sustainable landscape approaches, including through enhanced forest protection and ecosystem and landscape restoration. Such activities can in turn not only contribute to achieving countries' climate and biodiversity objectives but can build more resilient ecosystems and rural societies and economies, which is urgent for building more resilient and sustainable rural livelihoods, forest and landscapes. As such, UN-REDD's technical assistance in the identification and design of tailored REDD+ policies and measures, and their respective investment plans and programmes, is seen as essential. Moreover, the success of said actions will require enhanced global collaboration across the NBS movement in a way that ensures synergies with global initiatives on ecosystems and

⁹⁷ GEF, The GEF Small Grants Programme, UNDP. April (2020). Guidance on COVID-19 Response, recovery, and adaptive management. Draft.

forest restoration -like the Bonn Challenge, 4 per 1000, Initiative 20x20 and AFR100-and in support to the UNs Decade of Ecosystem Restoration.

- ☑ Clarify the financial landscape -public, private, domestic and international-, including opportunities and barriers, to realise forest solutions through policy and on-the-ground measures. The UN-REDD programme can play a key role in facilitating a better understanding of the financial landscape -both market and non-market, public and private- that could better fit the needs and approach for implementing forest and land-based actions, which largely vary from country to country. A clearer understanding on opportunities and barriers of the current and emerging financial landscape as a key element to designing actionable investment plans, as per examined above. This should include exploring options and implications under the cooperative approaches being negotiated under the Paris Agreement can significantly contribute to accelerate REDD+ implementation while enhancing forest countries' ambition in NDCs.
- Maximizing social and environmental benefits from REDD+ implementation through sustained support to address and respect REDD+ safeguards. There is broad recognition of the disproportionate impact of the pandemic in the most vulnerable populations and rural economies and livelihoods, particularly for indigenous peoples and local communities 'whose fate is intertwined with that of their land'. Private Evidence reviewed for this report and KIIs broadly agree that socio-economic recovery packages should foster social and environmental resilience while ensuring 'social equity, inclusion and the realization of human rights' for local communities and indigenous peoples. UN-REDD's country-tailored and unique approach to integrate the social, environmental and governance principles embedded in the Cancun Safeguards gains particular relevance in aligning REDD+ implementation with COVID-19 socio-economic responses as a means to ensure holistic recovery responses, as stressed by KIIs.
- Strengthened national capacities for monitoring and accounting high-quality emissions reductions and carbon removals remains a key priority. As explored in previous sections, addressing the climate emergency and leveraging the potential of forest solutions remains a priority to ensure we build a better, greener, more resilient and sustainable world consistent with the 1.5 °C target of the Paris Agreement. Forest monitoring and GHG accounting systems and structures are essential not only for demonstrating the mitigation potential realised from forest solutions, but also to unlock results-based financing and thus UN-REDD's cutting-edge technical assistance to measure robust, ambitious mitigation results that have environmental integrity remains seen as crucial by KIIs.

-

⁹⁸ Goldstein et al (2020), Protecting irrecoverable carbon in Earth's ecosystems, Nat. Clim. Change

3.2. Accelerating forest solutions rewards and leveraging forest carbon-based financing to support the COVID-19 socio-economic recovery

The UN-REDD Programme has played an instrumental role in supporting countries to move from design, to implementation, to securing results-based financing to reward forest solutions realised via REDD+ policy instruments. As such, the programme has played a key role in facilitating the identification and/or establishment of financial arrangements to capture and manage results-based financing. Similarly, in pioneer countries, the programme has facilitated strategic discussions towards the identification of financial needs and opportunities, which is seen as a crucial enabling condition to move towards on-the-ground implementation and policy level transformations, particularly in the context of aligning socio-economic COVID-19 recovery policies that do not undermine national efforts to tackle the climate crisis. In this context and recognizing the diverse stages of progress and approaches for REDD+ implementation across forest tropical countries, we examined below those strategic opportunities and priorities to be supported by the UN-REDD Programme:

☑ Leveraging novel forest carbon-based revenue streams to reward forest solutions and complement national COVID-19 recovery responses. Given the existing and emerging carbon-based financing opportunities to reward high-quality REDD+ implementation and recognizing that the UN-REDD Programme is uniquely positioned to provide strategic and technical assistance to secure and channel REDD+ results-based payments, KIIs broadly agree that this remains a priority. This is particularly true when considering the financial contribution that REDD+ results-based financing could represent to further expand national efforts to socio-economic recovery that enhance rural livelihoods. The experience gained by UN-REDD Agencies in facilitating access to RBPs under the GCF's pilot programme uniquely positions the UN-REDD Programme to support countries pursue higher levels of transparency and accuracy for real and high-quality mitigation outcomes that can secure novel carbon-based revenue streams.

3.3. Enhancing forest solutions to address the climate crisis and prevent future zoonotic pandemics

When considering that current unconditional and conditional targets in NDCs, the UN Environment's Emissions Gap report stressed that by 2030 such targets could result in annual emissions of around 53 GtCO₂, suggesting a gap of 13 GtCO₂ to reach the 2°C scenario and a gap of 29 GtCO₂ to reach the 1.5°C scenario.¹ Likewise, if current trends continue following to what has been expressed in current NDCs, greenhouse gas emissions would results in temperature average increase of roughly 3°C by 2100.¹ As broadly examined across this paper, addressing the climate crisis gains particular relevance in a post-pandemic world that is aligned with 1.5C pathways. In this sense, UN-REDD's strategic and technical assistance will be essential to further enhance climate ambition through forest solutions in new or revised NDCs.

Enhance and accelerate forest and land-based climate action under NDC. The technical and strategic assistance provided by the UN-REDD Programme for establishing not only policy but institutional and monitoring and accounting arrangements to support, monitor and measure the implementation of REDD+ results-

based actions is a significant step towards the integration of robust and science-based forest and land-based mitigation targets in countries NDCs in line with holistic socioeconomic recovery packages to building a better post-pandemic world. In doing so, as emphasized by most KIIs, the programme can play a crucial role in further leveraging financial resources for NDCs implementation, including for instance by identifying potential conditional targets in their NDCs that rely on potentially offering and transferring ITMOs from national or subnational REDD+ programmes.

3.4. Connecting actors and knowledge to foster a better, greener, more resilient and sustainable world through forest solutions

Both the socio-economic impact of the pandemic as well as the movement and activity restrictions imposed to handle the on-going health crisis are still being felt across the globe and could ultimately 'create disruptions of great magnitude and duration.' Despite the rapid uptake of digital technologies, significant divides remain, both between and within countries. [...] Only one in five people in [least developed countries' use internet'. 99 According to UNDP, 80% of population in developed countries have access to the Internet, 45% in developing and 20% in least developed countries. With widespread lockdown, the digital divide has become more significant than ever. Both literature and KIIs broadly agree that the 'new normal' will require adaptive management and thinking outside the box when it comes to connecting actors and knowledge to accelerate forest solutions. Likewise, KIIs have emphasized that while global and south-south cooperation are both essential and required the continued support from the UN-REDD programme, it was broadly acknowledged that digital cooperation to allow connecting and convening local stakeholders is urgent for REDD+ to be successful. 100 This in turn highlights the urgent need for innovative approaches to knowledge management, communications, convening and advocacy efforts that can deal with the challenges of digitalization posed by the pandemic. 101 In this context, key priorities identified by KIIs are examined below:

oxdot Connect global actors and knowledge to maximize the potential of forest solutions.

According to UNEPs COVID-19 response report, modernizing global environmental governance is one of the responses to the COVID-19 crisis so to find innovative solutions to environmental issues while lower environmental footprints and facilitating stakeholder engagement in a time of reduced mobility. For example, the Secretariat of the CDB has already moved its pre-COP 15 technical meetings to e-platforms and the same is true for the New York Climate Week. This said, UN-REDD programme has a critical role in connecting and convening actors across the NBS movement synergies between NBS and REDD+ agendas in the context of positioning forest solutions as part of COVID-19 recovery responses that are consistent with 1.5C pathways.

⁹⁹ UNCTAD, April 2020. The COVID-19 crisis: Accentuating the need to bridge digital divides.

¹⁰⁰ Pinner, D., Rogers, M., Samandari, H. (2020). 'Addressing climate changes in a post-pandemic world: The coronavirus crisis holds profound lessons that can help us address climate change-if we make greater economic and environmental resiliency core to our planning for the recovery.' McKinsey Quaterly. April. Accessed at: https://www.mckinsey.com/business-functions/sustainability/our-insights/addressing-climate-change-in-a-post-pandemic-world#

¹⁰¹ UNCTAD, April 2020. The COVID-19 crisis: Accentuating the need to bridge digital divides.

¹⁰² UNEP. ²020. 'Working with nature to protect people: UNEP's COVID-19 Response.' Accessed at: https://www.unenvironment.org/resources/working-environment-protect-people-uneps-covid-19-response

☑ Connect local actors and knowledge to accelerate on-the ground implementation of forest solutions. When it comes to digital cooperation, KIIs broadly agree that such innovative tools to connect actors and knowledge management, particularly for capacity building and awareness raising efforts with local staff and stakeholders including through podcasts, community radio, WhatsApp and other mobile phone applications.

Section 4. Next steps: An integrated UN-REDD COVID-19 path

Drawing on the strategic opportunities and priorities identified in the previous section, this section identifies opportunities for the UN-REDD Programme to integrate COVID-19 response and recovery approaches into its planning and activities, fostering the alignment of its technical assistance and knowledge management to the socio-economic recovery to the COVID-19 pandemic. These actions represent a blueprint for UN-REDD to integrate and align its 2021 Technical Assistance and further the 2021-2025 Results Framework with COVID-19 socio-economic recovery policies, both at the national and international levels.

Given the pace at which socio-economic recovery packages are being developed and deployed, it will be crucial for the UN-REDD Programme to help position REDD+ as *the* shovel ready forest solutions, supported by a robust, comprehensive, and proven operational, methodological, and institutional framework to build back better greener, more resilient and sustainable ecosystems, economies and societies. In this sense, the technical assistance and knowledge management activities of the UN-REDD Programme can become a way to align, integrate and strengthen the contribution of REDD+ actions to COVID-19 recovery. Such connection and alignment will benefit from the following approaches:

- 1. A robust and compelling narrative that positions forest and land-based solutions within the COVID-19 socio-economic recovery. This discussion paper, which has been revised and updated following to the UN-REDD EB meeting in mid-2020, provides the first of such a narrative. It will be distilled into a brief to better guide the UN-REDD Programme's technical assistance, knowledge management, resource mobilization, communications and advocacy efforts regarding REDD+ as *the* shovel-ready forest solution in the context of the COVID-19 socio-economic recovery.
- 2. Making the business case for REDD+ in domestic COVID-19 recovery responses. In order to integrate the strategic priorities and opportunities for COVID-19 socio-economic recovery through REDD+ implementation, the work of the UN-REDD Programme at country level will scope REDD+ enabling conditions and interventions that can be tailored to country-specific COVID-19 recovery circumstances and needs;
- 3. Making the business case for REDD+ in international COVID-19 recovery support packages. As the international community mobilises, designs and deploys COVID-19 recovery schemes, there is an opportunity to present forest solutions as a financial vehicle, thus generating a win-win green-recovery policy option. Building on country examples, forest solutions represent an avenue for building back better greener, more resilient and sustainable ecosystems, economies and societies, while enhancing multilateral collaboration and governance that delivers post-pandemic recovery efforts at the pace and scale required.

Bibliography

- 4 per 1000, 2015. Welcome to the 4 per 1000 Initiative. Available at: https://www.4p1000.org/.
- A.P. Davis et al., 2019, "High extinction risk for wild coffee species and implications for coffee sector sustainability", Science Advances, https://advances.sciencemag.org/content/5/1/eaav3473 (link as of 16th Dec 2019).
- Barbier, E.B. 2020. 'A green post-COVID-19 recovery.' In United Nations
 Association-UK (UNA-UK). Climate 2020: The path ahead. Witan Media, Painswick,
 UK. https://www.climate2020.org.uk/wp-content/uploads/2020/04/054-056-C2020 Barbier.pdf
- Boden, T.A., G. Marland, and R.J. Andres (2017), Global, Regional, and National Fossil-Fuel CO2 Emissions, Oak Ridge, Tenn., USA.
- Bonn Challenge. The Challenge: A Global Effort. Available at: http://www.bonnchallenge.org/content/challenge.
- Bronson, W. 2017, Natural climate solutions, Proceedings of the US National Academy of Sciences (PNAS)
- Busch J, et al, (2019), Potential for low-cost carbon dioxide removal through tropical reforestation. *Nat. Clim. Change* **9**, 463
- Business and Sustainable Development Commission, 2016. Better Business, Better World. BSDC, London. Available at: http://report.businesscommission.org/.
- CBD Decision XI/195
- CBD, 2018, Updated Assessment of Progress Towards Selected Aichi Biodiversity Targets and Options to Accelerate Progress
- Chao, S., 2012. Forest Peoples: Numbers across the World. Forest Peoples Programme, Moreton-in-Marsh, UK. Available at: http://www.forestpeoples.org/sites/fpp/files/ publication/2012/05/forest-peoples-numbers-acrossworld-final_0.pdf
- Christine K. et al, 2020, Global shifts in mammalian population trends reveal key predictors of virus spillover risk, The Royal Society, available at: https://doi.org/10.1098/rspb.2019.2736
- CIFOR, n.d. Forests and Climate Change. CIFOR, Bogor, Indonesia. Available at: https://www.cifor.org/forests-andclimate-change/.
- Climate Policy Initiative, 2020. Petersberg Climate Dialogue: Financing Climate Ambition in the Context of COVID-19. April. https://climatepolicyinitiative.org/event/petersberg-climate-dialogue-financing-climate-ambition-in-the-context-of-covid-19/
- Convention on Biological Diversity (CBD), n.d. Aichi Biodiversity Targets. CBD, Rio de Janeiro. Available at: https://www.cbd.int/sp/targets/.
- E. Cohen-Shacham, et al, 2016, Nature-Based Solutions to Address Societal Challenges. Gland, Switzerland: International Union for Conservation of Nature
- Ecosystem Marketplace, 2019. Financing Emissions Reductions for the Future: State of Voluntary Carbon Markets 2019. December. https://app.hubspot.com/documents/3298623/view/63001900?accessId=eb4b1a
- EU Parliament. P9_TA(2020)0124. European Parliament resolution of 15 May 2020 on the new multiannual financial framework, own resources and the recovery plan (2020/2631(RSP))

- EURACTIV, 2020. Green Deal will be 'our motor for the recovery', von der Leyen says. April. Accessed at https://www.euractiv.com/section/energy-environment/news/green-deal-will-be-our-motor-for-the-recovery-von-der-leyen-says/
- Euromonitor International, 2018, "Five most promising markets in coffee", http://go.euromonitor.com/rs/805-KOK
 719/images/Five_Most_Promising_Markets_in_Coffee.pdf?mkt_tok=eyJpIjoiT1RrME56TTFNalUxWmpoaSIsIn (link as of 16th Dec 2019).
- European Bank. Spending to counteract coronavirus creates change to tilt to green. Accessed at https://www.ebrd.com/news/2020/spending-to-counteract-coronavirus-creates-chance-to-tilt-to-green-.html
- European Green Deal must be central to a resilient recovery after Covid-19 Source Climate Home News 2020 https://www.climatechangenews.com/2020/04/09/european-green-deal-must-central-resilient-recovery-covid-19/
- FAO. 2020. The impacts of COVID-19 on the forestry sector: How to respond? Rome. Accessed at: http://www.fao.org/3/ca8844en/CA8844EN.pdf
- FAO and UNEP. 2020. The State of the World's Forests 2020. Forests Biodiversity and people. Rome. Accessed at: http://www.fao.org/3/ca8642en/CA8642EN.pdf
- Forest Rights groups, researchers and experts write to the Ministry of Tribal Affairs in India. (2020). 'Impact of COVID-19 Outbreak and Lockdown Measures on Tribal and Forest Dwellers (A Preliminary Report)'. Access: https://www.groundxero.in/2020/05/07/a-report-on-the-covid-lockdown-impact-on-tribal-communities-in-india/
- GCEC, 2015. Seizing the Global Opportunity; The Economics of Ecosystems and Biodiversity (TEEB), 2010.
- GEF, The GEF Small Grants Programme, UNDP. April (2020). Guidance on COVID-19 Response, recovery, and adaptive management. Draft.
- Global Forest Watch, available at: https://blog.globalforestwatch.org/data-and-research/global-tree-cover-loss-data-2019
- Goldstein et al (2020), Protecting irrecoverable carbon in Earth's ecosystems, *Nat. Clim. Change*. https://doi.org/10.1038/s41558-020-0738-8
- Gonzales, J. (2020). 'Brazil minister advises using COVID-19 to distract from Amazon deregulation.' Mongabay. Accessed at: https://news.mongabay.com/2020/05/brazil-minister-advises-using-covid-19-to-distract-from-amazon-deregulation/
- Government of Canada, 2020. Joint Statement by Brazil, Canada, Italy and Egypt following the Extraordinary High-Level Meeting of the Group of Friends of Food Security and Nutrition on the impact of COVID-19 on food availability and supply. April. https://www.canada.ca/en/global-affairs/news/2020/04/joint-statement-by-brazil-canada-italy-and-egypt-following-the-extraordinary-high-level-meeting-of-the-group-of-friends-of-food-security-and-nutrit.html
- Griscom et al. (2020) National mitigation potential from natural climate solutions in the tropics, The Royal Society. Available at: https://royalsocietypublishing.org/doi/10.1098/rstb.2019.0126#d3e1835.
- Hahn MB, Gurley ES, Epstein JH, Islam MS, Patz JA, Daszak P, Luby SP. 2014The role of landscape composition and configuration on *Pteropus giganteus* roosting ecology and Nipah virus spillover risk in Bangladesh. *Am. J. Trop. Med. Hyg.* 90, 247-255. Rulli MC, Santini M, Hayman DTS, D'Odorico P. 2017The nexus between forest fragmentation in Africa and Ebola virus disease outbreaks. *Sci. Rep.* 7, 41613.

- Hansen MCet al.2013High-resolution global maps of 21st-century forest cover change. *Science* **342**, 850-853
- Hepburn, C., O'Callaghan, B., Stern, N., Stiglitz, J., and Zenghelis, D. (2020), 'Will COVID-19 fiscal recovery packages accelerate or retard progress on climate change?', Smith School Working Paper 20-02. Accesed at https://www.smithschool.ox.ac.uk/publications/wpapers/workingpaper20-02.pdf
- IEA (2020a), 'Global Energy Review 2020,' Flagship Report, International Energy Agency (IEA).
- Independent Group of Scientists appointed by the Secretary-General, Global Sustainable Development Report 2019: The Future is Now Science for Achieving Sustainable Development, (United Nations, New York, 2019). Accessed at https://sustainabledevelopment.un.org/content/documents/24797GSDR_report_2019.pdf
- International Labour Organization ILO, 2020. The impact of COVID-19 on the informal economy. May. https://www.ilo.org/global/about-the-ilo/multimedia/video/institutional-videos/WCMS_744256/lang--en/index.htm
- IPBES (2019): Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. IPBES secretariat, Bonn, Germany. 56 pages. https://doi.org/10.5281/zenodo.3553579
- IPCC, 2019, Special Report on Climate Change, Desertification, Land Degradation, Sustainable Land Management, Food Security, and Greenhouse gas fluxes in Terrestrial Ecosystems. Chapter 1
- IPCC, 2019, Special Report on Climate Change, Desertification, Land Degradation, Sustainable Land Management, Food Security, and Greenhouse gas fluxes in Terrestrial Ecosystems.
- IPCC, Mitigation Pathways Compatible with 1.5°C in the Context of Sustainable Development
- IPCC's Special Report on Climate Change, Desertification, Land Degradation, Sustainable Land Management, Food Security, and Greenhouse Gas Fluxes in Terrestrial Ecosystems.
- Jones KE, Patel NG, Levy MA, Storeygard A, Balk D, Gittleman JL, Daszak P. 2008, Global trends in emerging infectious diseases. *Nature* 451, 990-993.
- Kissinger, G. 2019, Climate financing needs in the land sector under the Paris Agreement: An assessment of developing country perspectives, Elsevier. Available at: https://www.sciencedirect.com/science/article/pii/S0264837717313728
- Kumar, P. (2020). 'Centre stage for Nature in post-pandemic economic recovery process', The Indian Express. June. Accessed at: https://indianexpress.com/article/opinion/web-edits/centre-stage-for-nature-in-post-pandemic-economic-recovery-process-6448794/
- Kumar, P. (ed.), The Economics of Ecosystems and Biodiversity Ecological and Economic Foundations; Costanza et al., 2014. Changes in the global value of ecosystem services. Global Environmental Change, 26, 152—158. DOI: 10.1016/j. gloenvcha.2014.04.002;
- Laura S. P. Bloomfield, et al, 2020, Habitat fragmentation, livelihood behaviours, and contact between people and nonhuman primates in Africa, Landscape Ecology volume 35, pages985–1000
- Marion G Bastos Lima, et al (2017), The Sustainable Development Goals and REDD+: assessing institutional interactions and the pursuit of synergies, *International*

- Environmental Agreements: Politics, Law and Economics volume 17, pages 589–606 (2017)
- Maxwell et al. (2019). Degradation and forgone removals increase the carbon impact of intact forest loss by 626%. Science Advances. Available at: https://advances.sciencemag.org/content/5/10/eaax2546
- Mendulice, M. (2020). 'How to build back better after COVID-19'. World Economic Forum. Accessed at: https://www.weforum.org/agenda/2020/04/how-to-build-back-better-after-covid-19/
- NatureResearch Journal, 2020. Short-term tests validate long-term estimates of climate change. https://www.nature.com/articles/d41586-020-01484-5
- NYDF Assessment Partners. (2019). Protecting and Restoring Forests: A Story of Large Commitments yet Limited Progress. New York Declaration on Forests Five-Year Assessment Report. Climate Focus (coordinator and editor). Accessible at forestdeclaration.org.
- OECD, 2016. OECD Agricultural Policy Monitoring and Evaluation 2016: Highlights and Recommendations. Available at: https://www.oecd.org/tad/agricultural-policies/agriculture-policy-monitoring-flyer-2016.pdf.
- Pinner, D., Rogers, M., Samandari, H. (2020). 'Addressing climate changes in a post-pandemic world: The coronavirus crisis holds profound lessons that can help us address climate change-if we make greater economic and environmental resiliency core to our planning for the recovery.' McKinsey Quaterly. April. Accessed at: https://www.mckinsey.com/business-functions/sustainability/our-insights/addressing-climate-change-in-a-post-pandemic-world#
- Seddon N, Chausson A, Berry P, Girardin CAJ, Smith A, Turner B. 2020
 Understanding the value and limits of nature-based solutions to climate change and other global challenges. Phil. Trans. R. Soc. B 375: 20190120.

 http://dx.doi.org/10.1098/rstb.2019.0120
- The Economist. (2020). 'The Great Reversal: COVID-19 is undoing years of progress in curbing global poverty.' May. Accessed at: https://www.economist.com/international/2020/05/23/covid-19-is-undoing-years-of-progress-in-curbing-global-poverty
- The Food and Land Use Coalition, 2019. Growing Better: Ten critical transitions to transform food and land use. September. https://www.foodandlandusecoalition.org/wp-content/uploads/2019/09/FOLU-GrowingBetter-GlobalReport-ExecutiveSummary.pdf
- The Inter-American Development Bank (IDB) and the Inter-American Investment
 Corporation (IIC) together, the IDB Group announced the creation of <u>NDC</u>
 <u>Invest</u>, a one-stop shop to help countries access resources needed to translate national
 climate commitments into investment plans and bankable projects.
- United Nations Environment Programme and International Livestock Research Institute (2020). Preventing the Next Pandemic: Zoonotic diseases and how to break the chain of transmission. Nairobi, Kenya.
- UN General Assembly Resolution (A/RES/70/1) adopted on 25 September 2015
- UN-REDD Programme Policy brief, REDD+ and the 2020 Aichi Biodiversity Targets Promoting synergies in international forest conservation efforts
- UN, 2013. Economic Contribution of Forests. Background paper. United Nations, Geneva. Available at: http://www.un.org/esa/forests/pdf/session_documents/unff10/EcoContrForests.pdf.

- UN. April 2020. A UN Framework for the immediate socio-economic response to COVID-19.
- UN. Video message Financing for Development in the Era of Covid and Beyond. Accessed at
 - https://www.un.org/sites/un2.un.org/files/netherlands_video_message_pm_rutte.pdf
- UNCTAD, April 2020. The COVID-19 crisis: Accentuating the need to bridge digital divides.
- UNDP. May 2020. COVID-19: Human development on course to decline this year for the first time since 1990. Access:
 - https://www.undp.org/content/undp/en/home/news-
 - centre/news/2020/COVID19_Human_development_on_course_to_decline_for_the _first_time_since_1990.html
- UNEA concept note "Strengthening Actions for Nature to Achieve the Sustainable Development Goals". Paragraph 10. Available at:
 - https://wedocs.unep.org/bitstream/handle/20.500.11822/32130/Agenda%20 item 5-6%20-
 - %20Preparations%20for%20the%20fifth%20session%20of%20the%20Environment %20Assembly.pdf?sequence=1&isAllowed=y
- UNEP and FAO, 2020. Strategy of the United Nations Decade on Ecosystem Restoration. Draft for comments. February. http://wedocs.unep.org/xmlui/bitstream/handle/20.500.11822/31813/ERDStrat.pdf?sequence=1&isAllowed=y
- UNEP Emissions Gap report, 2018.
- UNEP, 2014. Building Natural Capital: How REDD+ Can Support a Green Economy. Report of the International Resource Panel. UNEP, Nairobi. Available at: http://www.unep.org/resourcepanel/Publications/ BuildingNaturalCapitalHowREDD/tabid/132320/
- UNEP. 2020. 'Working with nature to protect people: UNEP's COVID-19 Response.' Accessed at: https://www.unenvironment.org/resources/working-environment-protect-people-uneps-covid-19-response
- UNFCCC Decision 2/CP.17, preambular text.
- UNFCCC. Paris Agreement, Article 5.
- United Nations Environment Programme (UNEP) (2019), 'Emissions Gap Report 2019,' United Nations Environment Programme (UNEP), Nairobi.
- United Nations Sustainable Development Group. April 2020. 'A UN Framework for the immediate socio-economic response to COVID-19'. Accessed at: https://unsdg.un.org/sites/default/files/2020-04/UN-framework-for-the-immediate-socio-economic-response-to-COVID-19.pdf
- United Nations Sustainable Development Group. April 2020. 'A UN Framework for the immediate socio-economic response to COVID-19'. Accessed at: https://unsdg.un.org/sites/default/files/2020-04/UN-framework-for-the-immediate-socio-economic-response-to-COVID-19.pdf
- United Nations, 2020, A UN Framework for the immediate socio-economic response to COVID-19
- Wilkinson DA, Marshall JC, French NP, Hayman DTS. 2018Habitat fragmentation, biodiversity loss and the risk of novel infectious disease emergence. *J. R. Soc. Interface* **15**, 20180403
- World Bank, Stéphane Hallegatte and Stephen Hammer. Thinking ahead: For a sustainable recovery from COVID-19. March 2020.

- https://blogs.worldbank.org/climatechange/thinking-ahead-sustainable-recovery-covid-19-coronavirus?cid=SHR_BlogSiteShare_EN_EXT
- World Economic Forum, 2020, Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy. Available at http://www3.weforum.org/docs/WEF_New_Nature_Economy_Report_2020.pdf
- Wu, A., 2017. How Can Restoring Degraded Landscapes Deliver Financial Returns?