



TROPICAL FORESTS AND CLIMATE CHANGE

An issue primer for religious leaders and faith communities

A DEFINING MORAL CHALLENGE OF OUR TIME

Climate change and deforestation make the headlines as environmental and social challenges. But for religious and spiritual people, they are much more. They represent a profound failure to recognize the inherent value of the biodiversity and cultural diversity so intricately interwoven in tropical forests. As such, they are an affront to human dignity and to the moral scaffolding that underpins society and life itself.

Greenhouse gas emissions from human activities disrupt the atmosphere and increase the incidence and severity of floods, drought, wildfires, and other weather-related events. Meanwhile, the subjection of the Earth's bountiful and biodiverse forests to destruction by the highest bidder deprives the Earth of a crucial buffer against climate change and deprives indigenous peoples of homes and livelihoods that have been theirs for millennia.

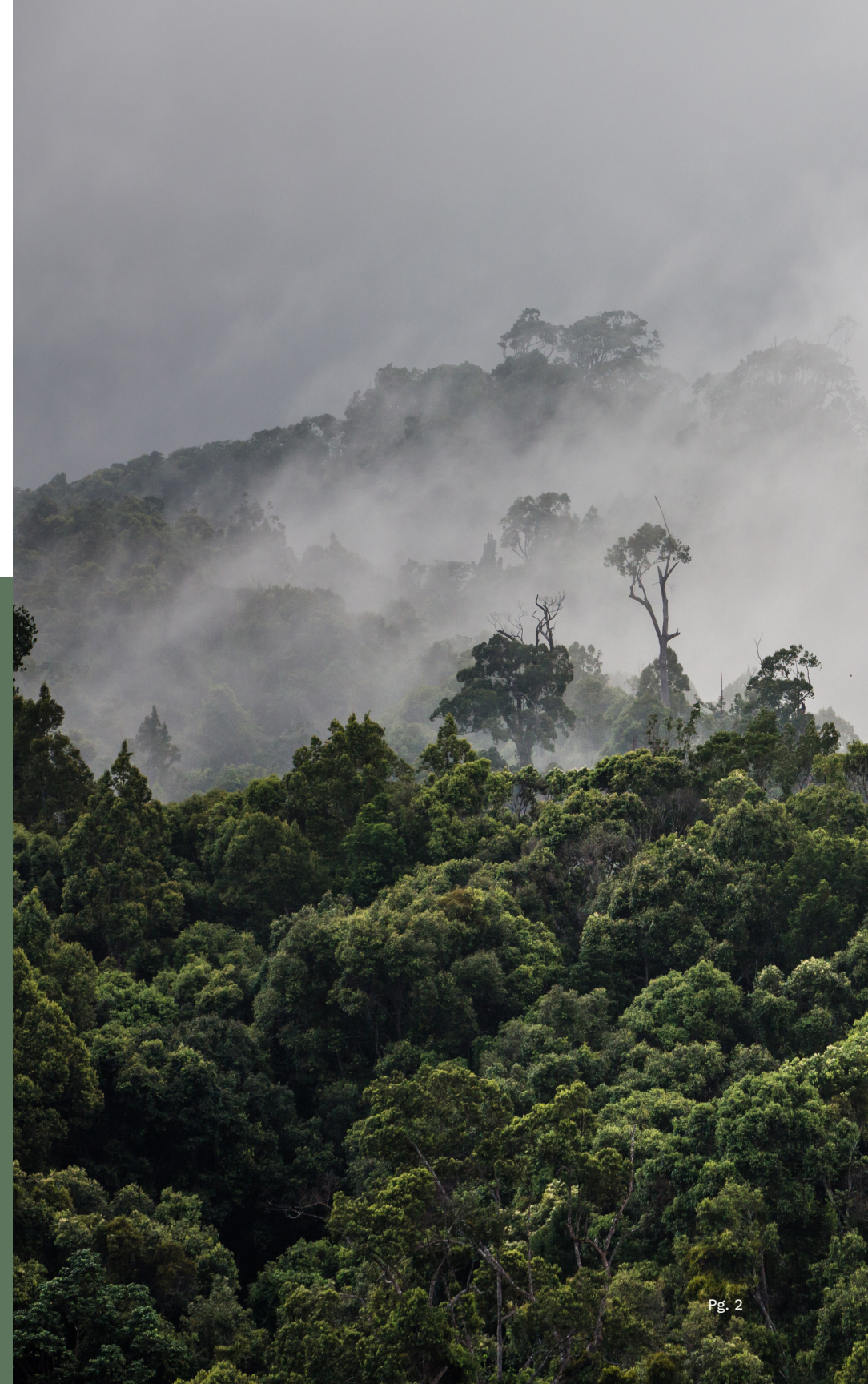
KEY FACTS

- The Intergovernmental Panel on Climate Change reports that we have only 11 years to limit global warming to 1.5° Celsius, beyond which even half a degree will significantly worsen the risk of droughts, floods, extreme heat and poverty for hundreds of millions of people.
- The protection, restoration and sustainable management of forests is essential to meeting the international goal of limiting global warming to 1.5° Celsius.
- Forests regulate our climate by absorbing and storing carbon dioxide from the atmosphere, where it would otherwise contribute to climate change.
- When forests are burned, cut down or degraded, their carbon is released back to the atmosphere.

The loss of tropical forests and the destabilization of our climate are a moral affront, magnified by a grave injustice: those who benefit the most from the activities that drive deforestation and climate change stand at a comfortable distance from their impacts, largely unaccountable for the damage they inflict, while the worst impacts of deforestation and climate change fall disproportionately on the world's poorest and most marginalised people. This deeply ethical dimension of the climate and deforestation crisis cries out for attention and redress and makes these environmental and social issues fundamentally religious and spiritual as well.

KEY FACTS

- If tropical deforestation were a country, its annual greenhouse gas emissions would be greater than those of the entire European Union.
- Carbon capture and storage will be necessary to achieve global climate goals.
- Forests are the only safe, natural and proven carbon capture and storage mechanism available to us at large scale.
- Halting deforestation and restoring degraded forests can reduce global greenhouse gas emissions by 24-30 percent.
- The longer the world waits before reversing current deforestation trends, the more the capacity of the remaining forests to capture and store carbon is eroded.
- Of the strategies available to reduce the emissions that cause climate change, protecting tropical forests is among the most affordable.
- Tropical deforestation and forest degradation are potent contributors to climate change, accounting for 16-19 percent of global greenhouse emissions.



WHAT IS CLIMATE CHANGE?

Greenhouse gases (such as carbon dioxide and methane) that occur naturally in the Earth's atmosphere trap heat from the sun and warm the Earth to a temperature that allows the Earth to support life.¹ This naturally-occurring process is known as the greenhouse effect, and without it the Earth would be too cold to sustain life as we know it. However, as more and more greenhouse gases are produced by human activities and emitted into the atmosphere, they amplify this natural effect, raising the Earth's average temperature in a process known as global warming.² Because this human-driven temperature increase alters climate patterns across the world, it is more widely referred to as climate change.³ Records show that the concentration of carbon dioxide currently in the atmosphere is higher than at any time in the last 800,000 years.⁴

To measure how much our planet is warming, scientists compare the average temperature of the Earth's surface now to its average temperature before the industrial era (around 1850), when greenhouse gas emissions began their rapid upward march. In 2015, the Earth's average temperature rise reached 1° Celsius above pre-industrial temperatures for the first time on record,³ and the following two years were even warmer.⁵ This warming of the planet is already contributing to an upsurge in deadly forest fires, hurricanes, record droughts and floods.⁵ The hard-won development gains of recent decades are at risk as climate change threatens human health,⁶ water,⁷ food security⁸ and economic growth,⁹ especially for the most vulnerable people and regions of the world.⁷ Indeed, the relentless progress of global warming has precipitated what many scientists and policymakers now call a climate crisis.



WHAT IS CAUSING CLIMATE CHANGE?

The Intergovernmental Panel on Climate Change (IPCC)—an international body set up by the World Meteorological Organization and the United Nations in 1988 to assess the science related to climate change—concluded that over the past 50 years our planet has warmed because of human activities,¹⁰ especially the burning of fossil fuels⁹ and the loss and degradation of tropical forests.^{9,11} Agriculture, forestry and land use change account for almost a quarter of greenhouse gas emissions.¹²

**Climate change
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INTERNATIONAL COMMITMENTS: THE PARIS AGREEMENT

Scientists estimate that the global average temperature of the Earth's surface is very likely to increase by more than 1.5° Celsius, and could rise by as much as 4.9° Celsius by the end of this century, compared to pre-industrial levels.¹³ A 2° Celsius increase is generally considered catastrophic for the natural environment and for human societies and economies as we know them.¹⁴ In response to this crisis, 185 countries have ratified the Paris Agreement,¹⁵ committing to keep global temperature rise this century well below 2° Celsius, and to make efforts to limit warming to 1.5° Celsius.¹⁶ To meet this goal, world leaders agreed that net greenhouse gas emissions must be reduced to zero by 2050.¹⁷ This represents a monumental ambition for a global economy that is built on carbon-emitting fossil fuels and large-scale agribusiness.

Under the Paris Agreement, countries are required to declare their contribution to achieving the agreement's goals.¹⁷ This is done through an instrument called 'Nationally Determined Contributions' (NDCs). So far, 183 countries have submitted their NDCs,¹⁸ outlining the actions they will take to help address climate change. Forests play an important part in the actions pledged by many countries.¹⁹ Countries have agreed to review and update their NDCs every five years, increasing their ambition over time, with the next revisions due by 2020.¹⁷ This ratcheting up of ambition and commitments is crucial because current commitments only represent some 20 percent of the reductions needed to meet the goal of keeping warming below 1.5° Celsius.¹⁷

To meet the goal of the Paris Agreement, net greenhouse gas emissions must be reduced to zero by 2050.



TROPICAL FORESTS AND CLIMATE CHANGE

The future of tropical forests and the global climate are inextricably linked. Addressing deforestation is a crucial part of the solution to climate change. Forests are natural carbon storehouses,²⁰ and although some analysts advocate for carbon capture and storage as a technological solution to climate change, the technology is expensive and unproven at scale. In fact, forests are the only safe, natural and currently available system for capturing and storing carbon at a large scale. Through the natural process of photosynthesis, trees absorb carbon dioxide (CO₂) from the atmosphere where, in excess, it would contribute to climate change. Instead, they store this carbon safely in their trunks, branches and leaves.^{21,22} Tropical forests contain about 470 billion tons of carbon—more than half the world’s terrestrial carbon, and nearly twice the amount that has accumulated in the atmosphere since the industrial revolution began.²¹

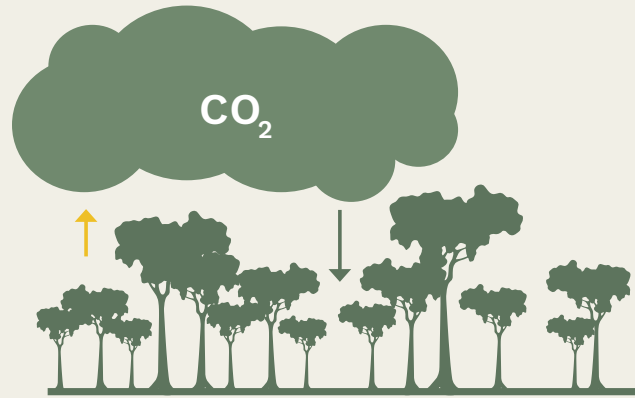
By contrast, when forests are burned, cut down or degraded, the carbon they were storing is released back into the atmosphere where it contributes to climate change.^{21,23} Deforestation also reduces the overall capacity of forests to absorb carbon from the atmosphere as the total area of tree cover declines. What’s more, the land uses that frequently replace forests—for example, agriculture or oil and gas extraction—are themselves major sources of greenhouse gas emissions. Tropical forests provide an invaluable service to humanity and to the planet by absorbing carbon dioxide emissions. But they are being destroyed and degraded at such a rate that, despite their huge potential to absorb carbon, they are actually becoming net sources of greenhouse gas emissions.^{20,24}

The damage to the atmosphere from destruction of tropical forests is far worse than the damage caused by destruction of temperate forests because tropical forests store so much more carbon.²¹ Tropical forests play such an important role in the carbon cycle that it is simply impossible to meet the Paris Agreement goal of limiting warming to 1.5° Celsius without urgent action to protect them. Agriculture, forestry and land-use change account for almost a quarter of all human-caused greenhouse gas emissions²³—more than any other activity except the burning of fossil fuels. About half of these emissions are caused by deforestation and forest degradation.²⁶ In fact, tropical deforestation alone emits more greenhouse gases than the entire European Union.²¹ If deforestation continues at the rates of the past few decades, forest-related emissions will eat up almost one-fifth of the emissions budget required to cap the increase in Earth's temperature at 1.5° Celsius.^{14,21}

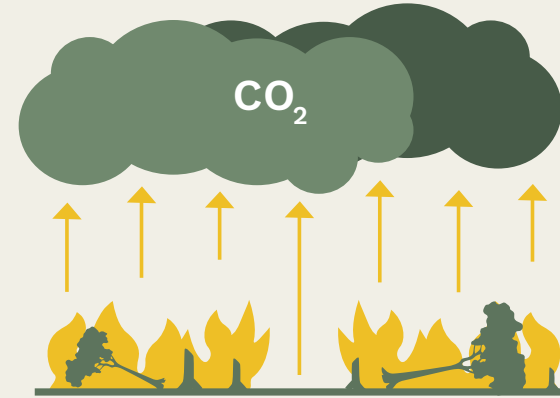
As climate change progresses, tropical forests will become more vulnerable. Changes in the Earth's climate are expected to reduce forest cover, shift the composition of species in various ecosystems, and disrupt many of the ecosystem services, including carbon sequestration, that tropical forests provide. These changes, in turn, will have considerable impact on the world's population, especially people whose livelihoods depend directly on tropical forests.^{21,27–29} As the Earth's temperature continues to rise, the continued deterioration of forests, and the resulting harm to people and ecosystems, makes urgent the need to save these precious ecosystems before it is too late.

Halting and reversing tropical deforestation is an essential part of the solution to climate change.

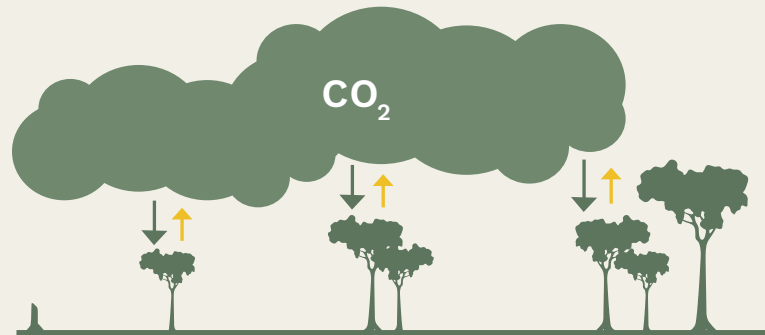
NATURAL FORESTS CAPTURE CO₂; DEFORESTATION RELEASES CO₂



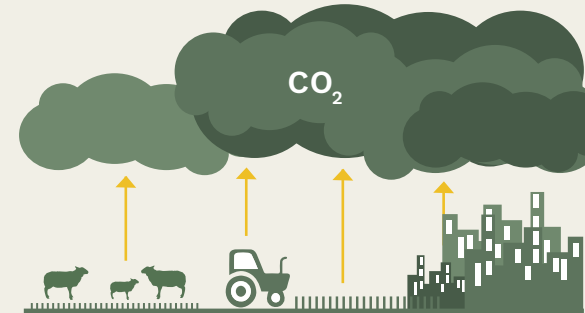
INTACT FORESTS
capture carbon in vegetation and soil



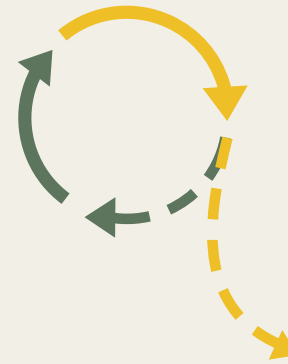
FELLING AND BURNING FORESTS
releases carbon that had been stored in vegetation and soil



REGROWING FORESTS
capture and accumulate carbon slowly over decades



CONVERSION
to pasture, agriculture, and urban areas produces ongoing emissions

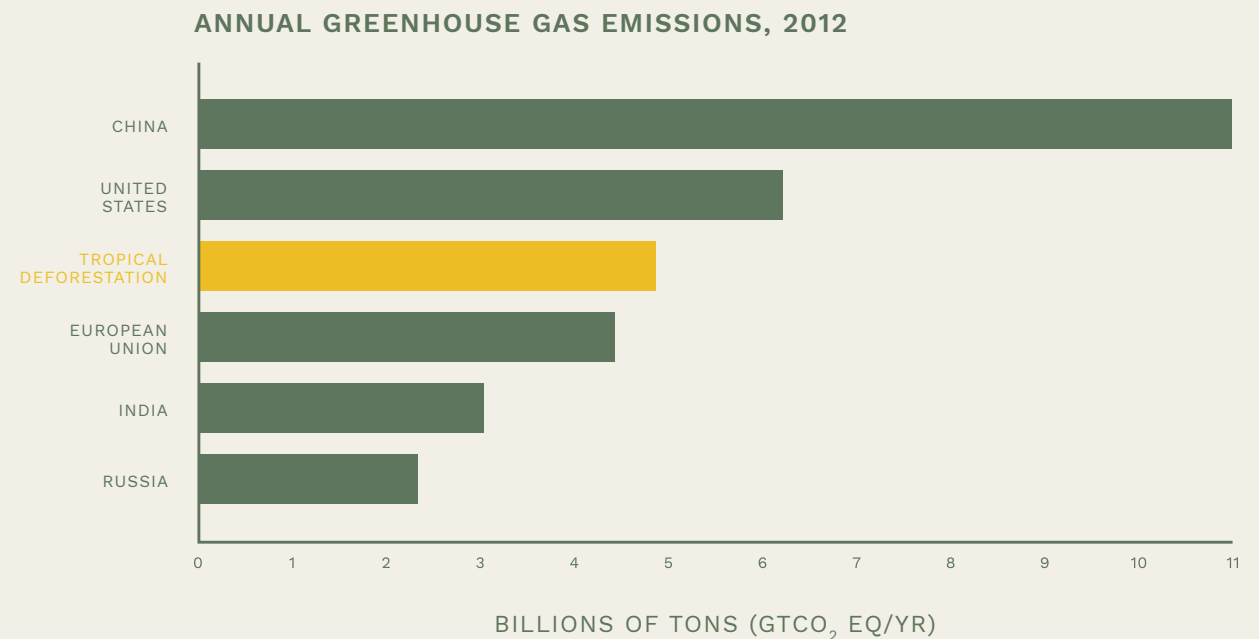


Source: Center for Global Development.


PEATLANDS AND CLIMATE CHANGE²⁵

Tropical peat-swamp forests are a type of tropical forest found in inundated areas across the Amazon and Congo Basins, and in Southeast Asia. Their soils have a distinct layer of organic matter, which is only partially decomposed due to a lack of oxygen. The loss, drainage and degradation of tropical peat-swamp forests as they are converted to other land uses releases much of this carbon, with severe implications for climate change mitigation. So far, only 15 percent of the world's peatlands—including tropical peat-swamp forests—have been drained, but they are responsible for 5 percent of all human-caused greenhouse gas emissions. Drained peat-swamp forests are also particularly prone to fires, which are extremely difficult to extinguish. Such fires produce even more emissions of carbon dioxide and methane; and generate haze and toxic substances that spread across large distances.²⁵ In 2015, large-scale fires across about 1.7 million hectares of peat-swamp forests and plantations in Indonesia released more emissions per day than the entire economy of the United States—almost 16 million tons of CO₂ per day. About half a million people had to be treated for their exposure to air contaminants, and the regional economy took a hit. Forest fires are a recurrent and worrisome consequence of degraded peat-swamp forests, with major implications at local, regional and global scales.

IF TROPICAL DEFORESTATION WERE A COUNTRY, ITS EMISSIONS WOULD BE GREATER THAN THOSE OF THE EUROPEAN UNION



Source: Center for Global Development; CAIT v2.0 (2012); Busch and Engelmann (2015); Emissions from deforestation refers to gross emissions from tropical forest cover loss and peat conversion.

A photograph of a lush, green forest landscape. The foreground is filled with dense, vibrant green trees. In the background, the forest continues up a hillside, but it is shrouded in a thick, white mist or fog, creating a sense of depth and atmosphere. A short, horizontal yellow line is positioned above the text on the left side of the image.

Because of the crucial role of tropical forests in the global carbon cycle, it is impossible to meet the goal of limiting warming to 1.5° Celsius without urgent action to protect them.



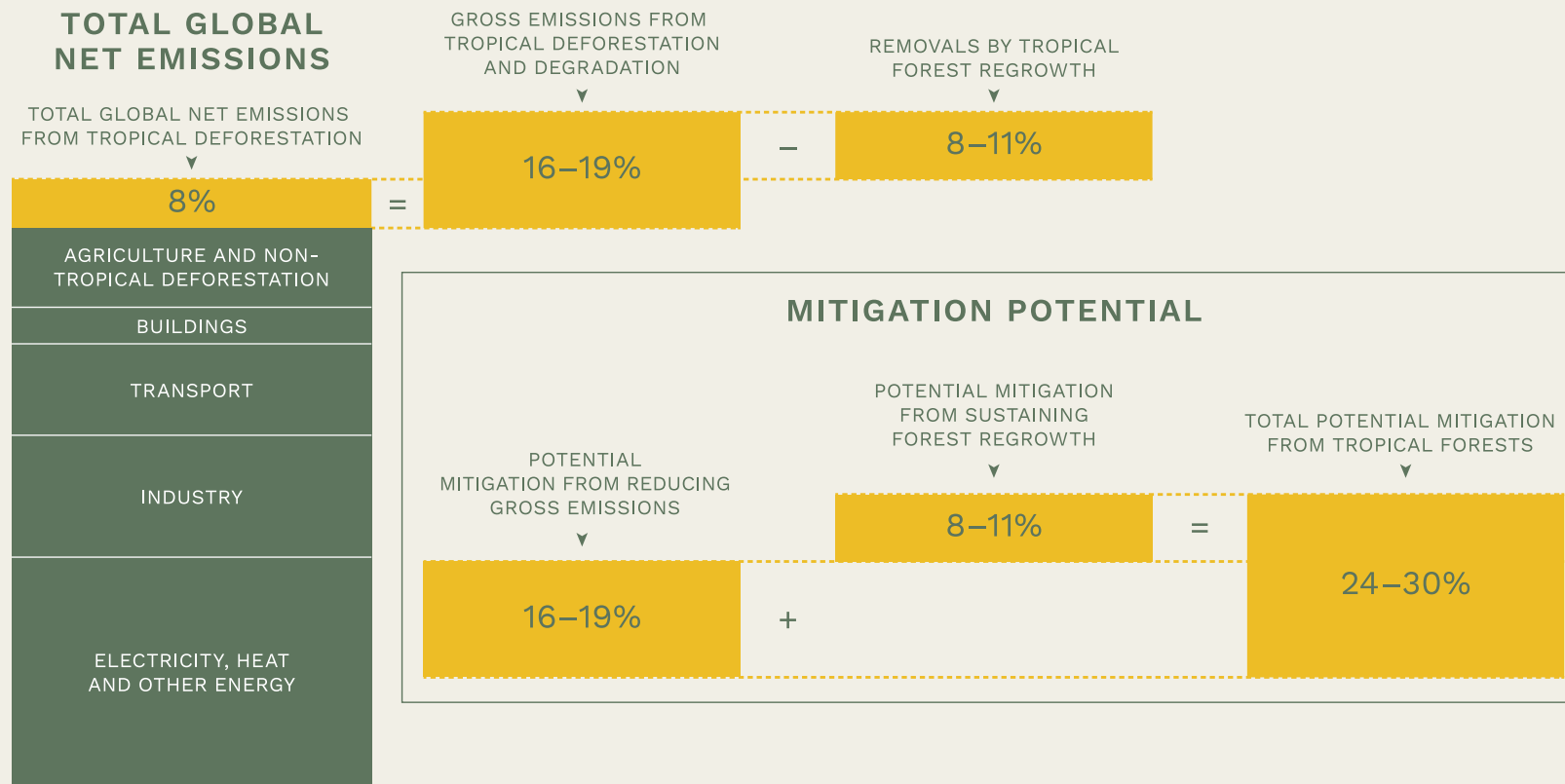
WE CAN'T SOLVE CLIMATE CHANGE WITHOUT PROTECTING FORESTS

Deforestation has increased to such an extent that tropical forests are now becoming a net source of greenhouse gas emissions. Gross tropical deforestation and degradation contribute about 16-19 percent of global greenhouse gas emissions, or 8 percent once the regrowth of forests is accounted for.²¹ But it doesn't have to be this way. If we recognize the roots of climate change, we can also see how forests are potentially a major part of the solution rather than the problem.

Even though net tropical deforestation and degradation only causes 8 percent of global emissions, halting and reversing it could reduce global greenhouse gas emissions by up to 30 percent.²¹ This is because halting and reversing deforestation would not only avoid emissions of greenhouse gases when forests are burned or cleared, but would also result in additional absorption of CO₂ as tropical forests are allowed to regrow.²¹

Every future climate scenario evaluated by the IPCC shows that capturing massive quantities of atmospheric carbon and storing it safely away will be needed to meet the goals of the Paris Agreement.^{14,23} Forests are currently the only safe and natural carbon capture and storage mechanism available at a large scale,^{30,31} so protecting them is critical to meeting the world's climate mitigation goals. Put simply, if we are to have any chance of avoiding catastrophic climate change, deforestation must stop. Forest restoration and sustainable forest management also happen to be some of the most cost-effective options we have to meet emissions reduction goals. What's more, protecting and restoring forests will bring added social, economic and environmental benefits beyond climate change mitigation,²³ including enhanced food security; pollination; pest control; water provision; soil erosion control, and many other ecosystem services.²³

NET TROPICAL DEFORESTATION PRODUCES 8 PERCENT OF NET EMISSIONS, BUT HALTING AND REVERSING TROPICAL DEFORESTATION COULD REDUCE TOTAL NET EMISSIONS BY UP TO 30 PERCENT



Source: Center for Global Development; Y. Pan et al., "A Large and Persistent Carbon Sink in the World's Forests," Science 333, no. 6045 (2011): 988-93; A. Baccini et al., "Estimated Carbon Dioxide Emissions from Tropical Deforestation Improved by Carbon-Density Maps," Nature Climate Change 2, no. 3 (2012): 182-85

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ABOUT THIS PRIMER

This primer is part of a series of briefs meant to inform and inspire faith communities to action to help safeguard tropical forests and their inhabitants. Through facts, graphics, analysis, and photos, these primers present the moral case for conserving and restoring rainforest ecosystems, supported by the latest science and policy insights. They bring together the research and practical tools that faith communities and religious leaders need to better understand the importance of tropical forests, to advocate for their protection, and to raise awareness about the ethical responsibility that exists across faiths to take action to end tropical deforestation.

PARTNERS

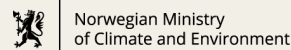
The Interfaith Rainforest Initiative welcomes engagement by all organizations, institutions and individuals of good faith and conscience that are committed to the protection, restoration and sustainable management of rainforests.

INTERFAITH RAINFOREST INITIATIVE

The Interfaith Rainforest Initiative is an international, multi-faith alliance working to bring moral urgency and faith-based leadership to global efforts to end tropical deforestation. It is a platform for religious leaders and faith communities to work hand-in-hand with indigenous peoples, governments, NGOs and businesses on actions that protect rainforest and the rights of those that serve as their guardians. The Initiative believes the time has come for a worldwide movement for the care of tropical forests, one that is grounded in the inherent value of forests, and inspired by the values, ethics, and moral guidance of indigenous peoples and faith communities.

QUESTIONS?

The Interfaith Rainforest Initiative is eager to work with you to protect tropical forests and the rights of indigenous peoples. Contact us at info@interfaithrainforest.org.





INTERFAITH
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INITIATIVE

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