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# CIO Nature Series

A stylized illustration of a rainforest landscape. The foreground is dominated by dense, vibrant green foliage with various shades of green and yellow highlights. A winding river or stream flows through the middle ground, reflecting the surrounding greenery. In the background, rolling hills and mountains are depicted in shades of blue and green, under a clear blue sky. The overall style is modern and artistic, using flat colors and bold shapes.

Rainforests: the  
Earth's green lung



# Rainforests: the Earth's green lung

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## What they are

Rainforests are an essential ecosystem for the Earth - some of them have existed in their present form for at least 70 million years.

Rainforests are generally structured in four layers: an emergent layer with tall trees that can grow up to 60 meters high, a canopy layer that shades the forest floor, and an understory and forest floor with a diverse array of plant and animal species.

Every continent, with the exception of Antarctica, supports rainforests. The largest are located along the Congo and Amazon rivers.

Dense rainforest ecosystems can also be found in regions of Australia and Southeast Asia. Even the cool evergreen woods of Northern Europe and the Pacific Northwest of North America can be considered a type of rainforest - the so called temperate rainforests.<sup>1</sup>

Rainforests are an essential part of the natural world and are critical for all life on earth.



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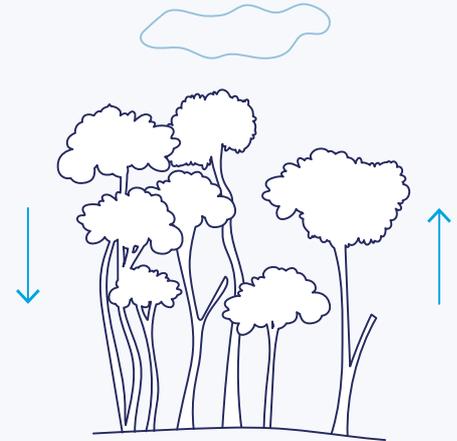
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# How rainforests help us

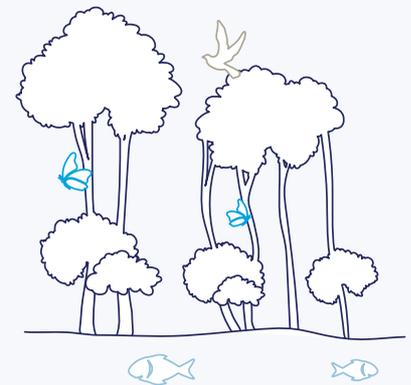
## Climate management

About 20% of the oxygen we breathe is produced by rainforests, which also store a significant amount of carbon dioxide. Additionally, rainforests absorb enormous amounts of solar radiation, contributing to the regulation of global temperatures.<sup>1</sup> The Amazon also produces a large amount of water and influences air mass circulation, affecting rain patterns in Latin America and surrounding regions.<sup>2</sup> Cutting trees down therefore threatens many fundamental ecosystem services which directly affect millions of people. Trees not only absorb carbon dioxide from the atmosphere, they also store carbon in their roots, leaves, and trunk (for example, an estimated 48 billion tons of carbon is stored in the Amazon rainforest alone).<sup>3</sup>



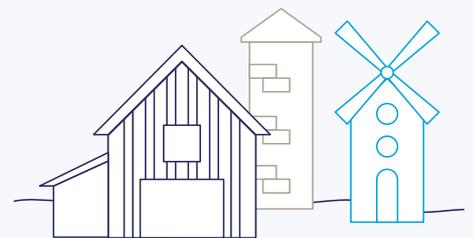
## Biodiversity

Rainforests are home to more than half of the world's plant and animal species. As many as 1,500 flowering plants, 750 tree species, 400 bird species, and 150 butterfly species can be found in a 10 km<sup>2</sup> patch.<sup>1</sup> Encompassing an area of 6.7 million km<sup>2</sup> (twice the size of India), the Amazon ecosystem is unsurpassed in scale and complexity<sup>4</sup>: it accommodates around 40% of the Earth's remaining rainforest, 25% of its terrestrial biodiversity and more fish species than in any other river system, including endemic and endangered flora and fauna.<sup>5</sup>



## Rural livelihoods

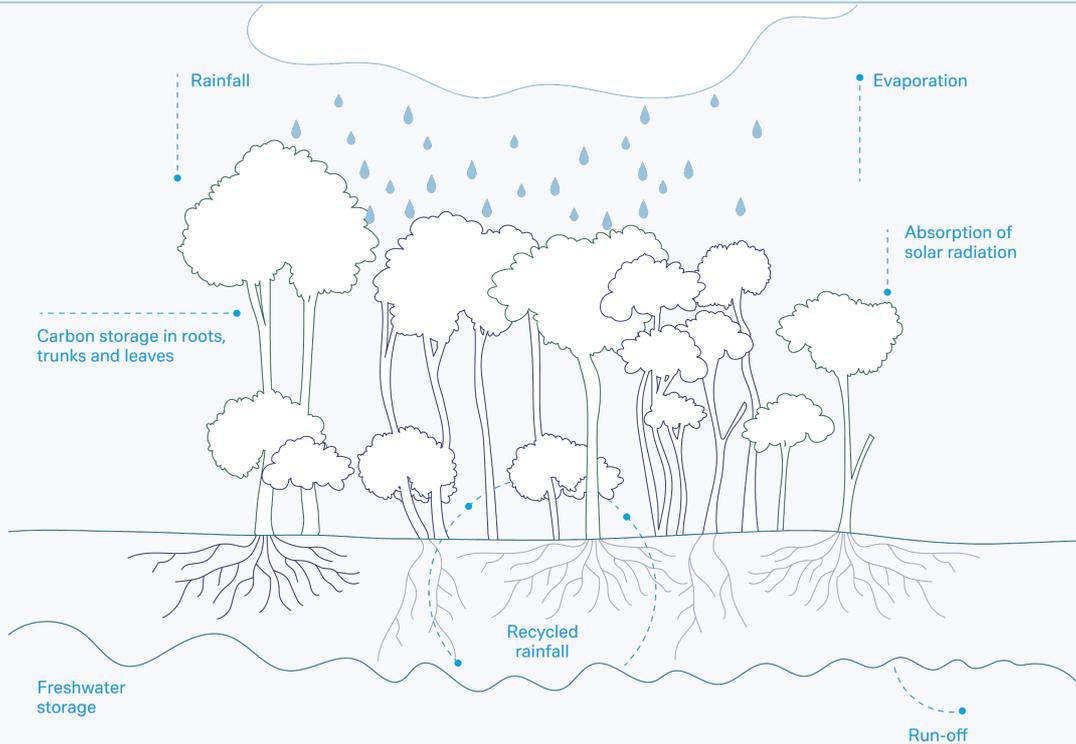
Rainforests support rural populations and economies by providing goods as an important source of harvest and creating jobs for populations with few alternative off-farm employment options.<sup>6</sup> One study estimates that the mean value of the provision of habitat for species, carbon sequestration, water regulation, recreation and ecotourism is worth over USD400mn a year to the local populations of the Brazilian Amazon ecosystem alone.<sup>7</sup>



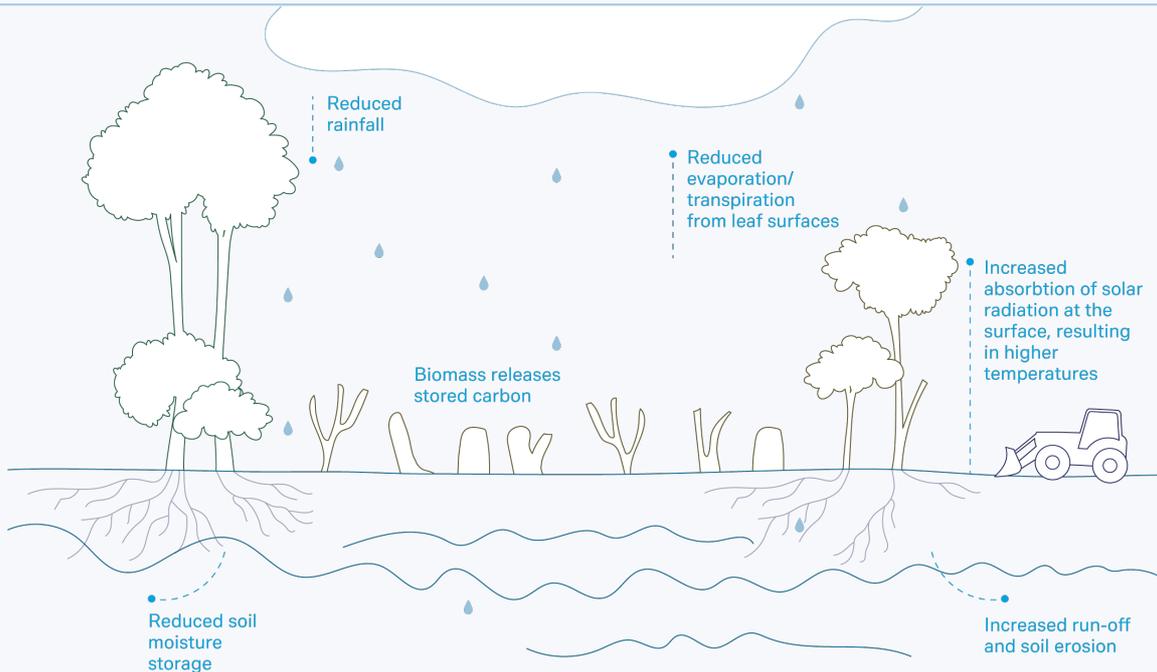
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## Healthy rainforest:



## Rainforest affected by deforestation:



Sources: Butler, 2019<sup>16</sup>, Welch, 2019<sup>17</sup>, The Nature Conservancy, 2020<sup>2</sup>, Deutsche Bank AG. July 2023.

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# Threats to rainforests

For all their magnitude and remoteness, rainforests are fragile but invaluable ecosystems. Significant damage is done to them every day.

## Deforestation

Deforestation is among the biggest threats to rainforests. Since 1947, the overall area of tropical rainforests has likely decreased by more than half, to about 6.2 - 7.8 million km<sup>2</sup>.<sup>1</sup> Scientists warn that the loss of 20-25% of the rainforest could imply a “point of no return” for the Amazon. Given the current pace of destruction, this could happen in no more than 20 years.<sup>2</sup>



## Climate change

Climate change is hurting rainforests. Natural cycles are being altered, upsetting a delicate balance at local, regional and even global levels.<sup>2</sup> If current climate trends continue, the Amazon rainforest could experience a serious decrease in rainfall, leading to widespread forest dieback and changes in the ecosystem that could potentially convert parts of the Amazon rainforest into a type of dry savanna.<sup>8</sup>



## Poaching and illegal trade in wildlife

Poaching and illegal trade in wildlife pose a significant threat to rainforest biodiversity. Wildlife trafficking is supported by a large consumer market: it is estimated that 38 million animals (excluding fish and invertebrates) are captured every year in Brazil alone.<sup>9</sup>

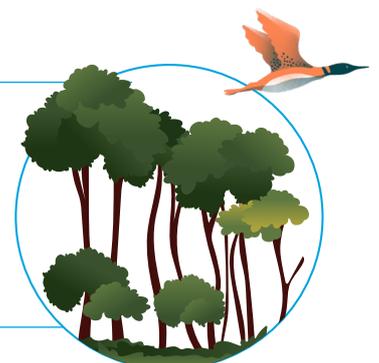


## Mining and oil drilling

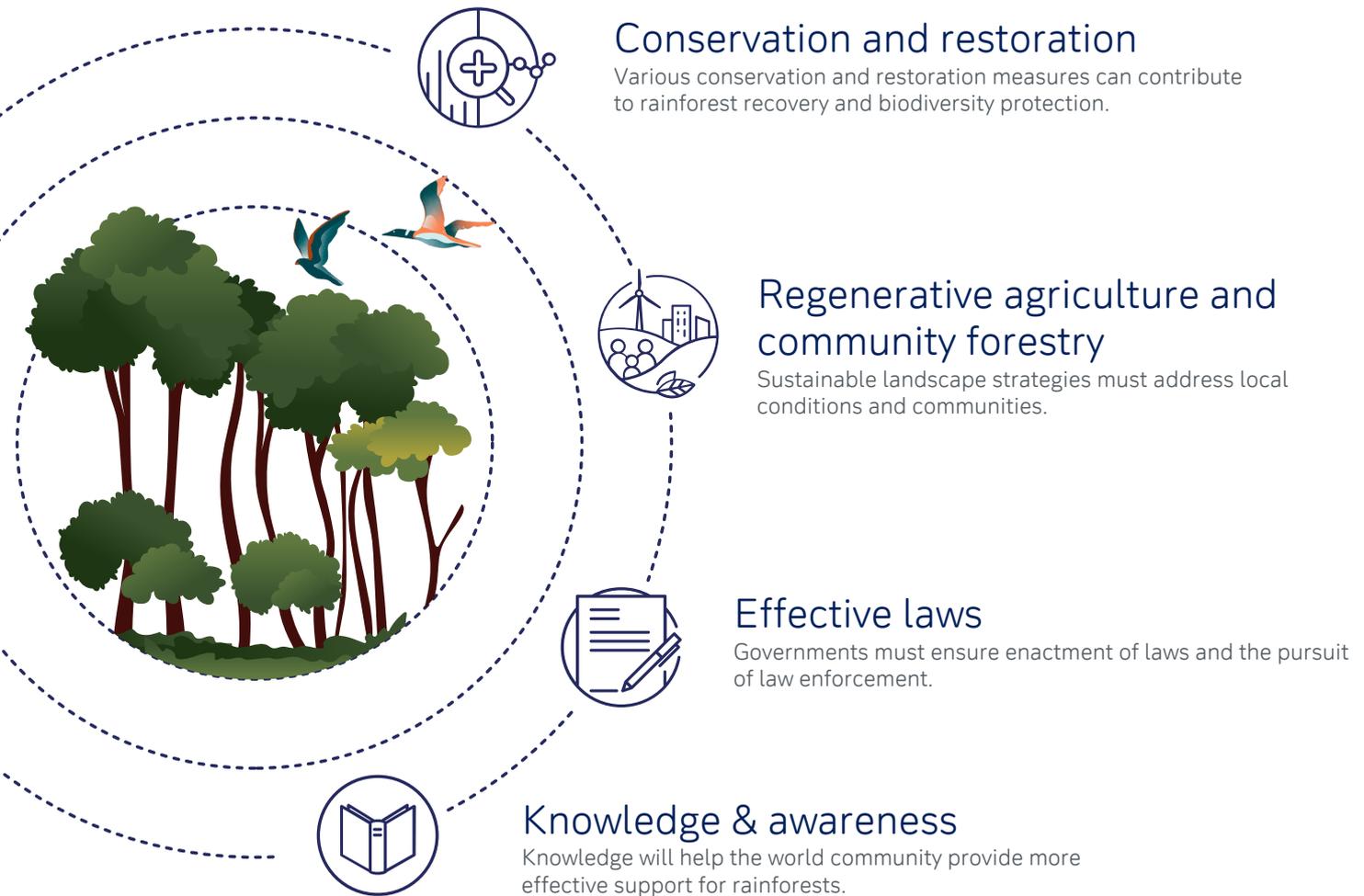
Mining and oil drilling are also significant threats to rainforests, particularly in the Amazon and Congo basins. They can lead to habitat destruction, soil erosion, and pollution, among other environmental problems.



**“About 20% of the oxygen we breathe is produced by rainforests, which also store a significant amount of carbon dioxide.”**



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## What can humanity do?

**Conservation and restoration.** As a major conservation goal, the 30 by 30 target, aiming to protect and conserve 30% of land and ocean areas by 2030, has been included in the Kunming-Montreal Global Biodiversity Framework and is receiving strong global support.<sup>11</sup> New types of financial instruments can provide the needed capital. For example, in 2001, The Nature Conservancy (TNC), the U.S. government and the government of Belize agreed to sign a debt-for-nature swap to preserve about 90 km<sup>2</sup> of rainforest in Belize and secure its management in the future. The agreement involves the reduction of debts with a total face value of USD 9.7 million owed by Belize, in exchange for payments to local conservation organizations.<sup>12</sup> Intervention can yield impressive results: Due to its high dependency on rainforests and with the help of a comprehensive package of measures that includes the establishment of protected areas, payments for ecosystem services (PES) and ecotourism, Costa Rica is one of the first countries in the world to reverse deforestation. Tropical rainforests now cover almost 60% of the country's land area, having shrunk to 40% in 1987.<sup>13</sup>

**Regenerative agriculture and community forestry.** Partnering with forest communities around the world helps advancing sustainable landscape strategies that support local livelihoods in harmony with the health of forests. For example, Rainforest Alliance's work with ten community-run forestry concessions in Guatemala has resulted in near-zero deforestation for 20 years and a drastically lower incidence of forest fires.<sup>14</sup>

**Effective laws.** Governments must ensure enactment of laws and the pursuit of law enforcement. Proper land demarcations, tougher fines for human intrusions, regulation of deforestation for industrial purposes – such as tea and coffee plantations – and prevention of species trafficking are part of this.<sup>15</sup>

**Knowledge and awareness.** Knowledge – not just around supply chains – will help the world community provide more effective support for rainforests. To enable greener and more inclusive economies, it is crucial to understand their economic value and to conserve them.<sup>15</sup>

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## Glossary

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**Debt-for-nature swaps** involve restructuring sovereign debt in exchange for debtors' investment in nature conservation, usually with a portion of the debt forgiven.

**Kunming-Montreal Global Biodiversity Framework** The Kunming-Montreal Global Biodiversity Framework is an outcome of the 2022 United Nations Biodiversity Conference and considered one of the most significant agreements to date. It contains four goals and 23 targets. "Target 3" is especially referred to as the 30 by 30 target.

**UN-REDD Programme** The UN-REDD Programme, established by the three UN agencies (UNEP, UNDP, FAO), is a multi-donor trust fund that allows donors to pool resources and provide funding with the aim of significantly reducing global emissions from deforestation and forest degradation in developing countries.

**USD** is the currency code for the U.S. Dollar.



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