Save the Amazon Rainforest Shirley, cloudyclimate.org March 3, 2025

Around the world, over 420 million hectares of forest (about ten Californias) were lost to deforestation from 1990 to 2020, and more than 90% of the deforestation was in the tropics.[1] Beef, soy, and palm oil are responsible for 60% of tropical deforestation. Cattle meat is primarily for domestic consumption but is also exported. Soybeans replace tropical rainforest in the Amazon, mainly for animal feed, while palm oil is harvested in Southeast Asia.[2] Roads have a huge impact on deforestation by increasing accessibility to the forest. Logging, mining, oil extraction, and illegal activities also contribute to deforestation.

The Amazon is the world's largest tropical rainforest. It covers 40% of South America and is roughly the size of the contiguous US. Conventionally, rainfall produces forests, but forests also make rain. The forest releases moisture by surface evaporation and by transpiring water via roots up through leaves. The large amount of water vapor condenses and lowers area air pressure, helping to pull air inland. Thus are formed the Amazon's "flying rivers" or rios voadores.[3] These low-level winds carry water evaporated from the Atlantic Ocean westward, pick up vapor transpired by the forest, turn south at the Andes mountains, and distribute moisture across South America (except Chile, on the other side of the Andes). The rainforest recycles moisture five to six times and contributes up to 50% of rainfall in the region. From the east flank of the Andes, water flows into the Amazon River and on into the Atlantic Ocean. The Amazon River carries 20% of the world's total river input to the oceans.[4] Forests also have cooling effects through shade and evapotranspiration, nurture soil, ameliorate floods, and filter water and air.[5]

If the Amazon water cycle depends on the forest, what happens with deforestation? Fewer trees mean less rainfall, increased surface run-off, and hotter temperatures. Winds blowing through cleared areas down more trees during storms. Slash and burn methods for clearing land are no longer limited by the rainforest's natural moisture; fires are multiple and burn larger areas. On top of this, global warming brings more heat, drought, and fire. As water stresses from deforestation are compounded by climate change, the tropical rainforest is approaching a tipping point when it could transform into degraded savannah or degraded secondary forest.[6]

What is at stake? The Amazon rainforest is home to more than 40 million people, including 2.2 million Indigenous peoples, and provides livelihoods, food, water, fish, and transport. Regional agriculture relies on the aerial rivers. It's possible that shifts in such a large portion of the water cycle could affect precipitation on other continents. The Amazon is notable for its biodiversity.[4,7] Forests are our allies against climate change. Globally, forests have been absorbing twice as much carbon as they emit, overall removing about 7.6 billion tonnes of CO2 per year.[8] The Amazon rainforest stores about 150 billion tonnes of carbon in soil and vegetation[1] and has been a net carbon sink. Now the more vulnerable southeastern part of the Amazon has become a carbon emitter.[9]

A half century ago, calls to "Save the Amazon" drew attention to deforestation for cattle and rubber, accelerated by new road construction. Deforestation slowed, but then rose to new peaks.[10] Deforestation in Brazil fell dramatically in the early 2000s, with 24 million hectares of new protected areas, acknowledgement of Indigenous lands and rights, beefed up law enforcement, and targeted incentives.[11] Indigenous territories have lower deforestation rates than other forests.[12] Although deforestation is again declining, degradation from fires is up sharply, spiking in 2024. That will be the setting for COP30 in Belém later this year, the first Climate Change Conference to be held in the Amazon. Countries have pledged to halt deforestation by 2030 but are not on track to achieve this.[13]

To save the Amazon means limiting deforestation and global warming. Forests are integral to both the carbon cycle and the water cycle. We may talk about climate change, biodiversity, food, water, and health as if they were separate issues, but everything is interconnected. Water is life! Water is more precious than oil. If we take care of the forest, the forest takes care of us. Saving the Amazon is saving ourselves.

FOOTNOTES

[1] Global Forest Resources Assessment (FRA) 2020. Food and Agriculture Organization (FAO) of the United Nations (https://doi.org/10.4060/ca8753en – key findings; https://doi.org/10.4060/ca9825en – main report). Are you wondering about losing ten Californias worth of forest? If forest expansion by regeneration or new growth is included, then *net* global deforestation since 1990 comes to 178 million hectares (ha). In the latest report period 2015-2020, annual global deforestation averaged 10 million ha, and *net* deforestation of 5 million ha per year (still too much). A hectare is about 2.5 acres; 100 hectares = 1 km^2. The FAO defines deforestation as a change in land use, so that a clear-cut forest followed by agriculture is deforestation, but not a clear-cut forest left to regrow. Tree cover loss reported by satellite monitoring may include logging and damage from fire, disease, and storms that are not considered deforestation. Both deforestation and degradation are sources of carbon. For more on measuring deforestation: Global forest watch and the forest resources assessment, explained in 5 graphics. S Carter et al, Jun 2023 (https://www.globalforestwatch.org/blog/data/global-forest-watch-and-the-forest-resources-assessment-explained-in-5-graphics-2/)

[2] Drivers of deforestation. H Ritchie, rev May 2024 (https://ourworldindata.org/drivers-of-deforestation)

[3] About Eneas Salati, the father of the flying rivers: Measuring the small water cycle. A Lo, Dec 2024 (https://climatewaterproject.substack.com/p/measuring-the-small-water-cycle-the)

[4] Science Panel for the Amazon, Amazon Assessment Report. C Nobre et al, 2021 (https://eng-ar21.sp-amazon.org/220717_SPA%20Executive%20Summary%202021%20(English).pdf)

[5] Trees, forests and water: cool insights for a hot world. D Ellison et al, Mar 2017 (https://doi.org/10.1016/j.gloenvcha.2017.01.002)

[6] Critical transitions in the Amazon forest system. BM Flores et al, Feb 2024 (https://doi.org/10.1038/s41586-023-06970-0)

[7] Amazonia's future: Eden or degraded landscapes? TE Lovejoy (https://royalsociety.org/news-resources/projects/biodiversity/amazonias-future/) - commentary

[8] Forests absorb twice as much carbon as they emit each year. N Harris & D Gibbs, Jan 2021 (https://www.wri.org/insights/forests-absorb-twice-much-carbon-they-emit-each-year). Forests act as both sink and source for carbon, removing 16 billion metric tonnes of CO2 per year but emitting 8 billion from deforestation and other disturbances; overall absorbing on average 7.6 billion tonnes of CO2 a year. Of the three largest tropical rainforests, the Congo is a net carbon sink, Southeast Asia is a net carbon source, and the Amazon was a carbon sink but is now partially a carbon emitter.

[9] Deforestation, warming flip part of Amazon forest from carbon sink to source. T Stein, Jul 2021 (https://research.noaa.gov/deforestation-warming-flip-part-of-amazon-forest-from-carbon-sink-to-source/)

[10] The year in tropical rainforests: 2024. RA Butler, Dec 2024 (https://news.mongabay.com/2024/12/the-year-in-tropical-rainforests-2024/)

[11] Don't blame the trees! Saving forests is still the best way to save the planet. JW Reid & P Moutinho, Dec 2023 (https://www.theguardian.com/global-development/2023/dec/20/dont-blame-the-trees-saving-forests-is-still-the-best-way-to-save-the-planet?CMP=Share_iOSApp_Other)

[12] Forest governance by Indigenous and tribal peoples. FAO, Mar 2021 (https://www.fao.org/americas/priorities/indigenas-gobernanza-bosques/en)

[13] Forest declaration assessment, summary for policymakers, Oct 2024 (https://forestdeclaration.org/wp-content/uploads/2024/10/2024SummaryforPolicymakers.pdf)

EXTRA: Nature's heartbeat, Jul 2018 (https://worldmapper.org/natures-heartbeat/)